

SCHOOL AND COLLEGE PLACEMENT

Journal of the Pennsylvania Association of School and College Placement

CLARENCE E. CLEWELL

Editor

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INFORMATION FOR SUBSCRIBERS

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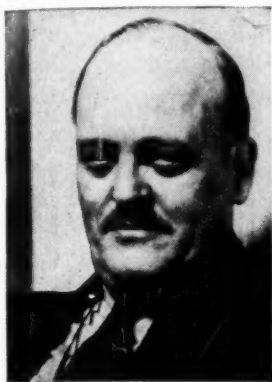
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PLASTICS—A NEW INDUSTRY

E. F. LOUGEE

*Chairman, Advisory Board
Plastics Industries Technical Institute*

ALTHOUGH plastics have been present in the chemical scheme of life since the Dark Ages, the Plastics Industry, as such,



Mr. Lougee

is comparatively new. It attained its greatest stature between the years 1930 and 1940 and, if its progress during that period may be taken as the index for its growth during the next ten years, ample opportunity should exist for those who choose plastics as a career.

National defense and the rearmament program may give plastics the opportunity they have long awaited to prove their value as replacement materials. Increased use of plastics by manufacturing industries as a means of conserving the supply of "vitally needed" metals, was urged recently by Edward R. Stettinius, Jr., director of priorities, Office of Production Management.

"With defense industries making compelling demands on the available supply of such metals," the former Chief of United States Steel Corporation said, "it appears that the supply available for other production in the non-defense sphere will be diminished. This means, in turn, that the whole question of plastics now becomes more important than ever before."

Choosing plastics as a career is not as simple as it might appear because the field is complex indeed. It comprises a number of well-defined branches, each with its

peculiar problems and techniques. The scope of activities covered by these various branches as a unit, however, is broad enough to embrace the interests and talents of many men with technical ability and training, especially in chemistry, engineering and sales.

Before examining the structure of the Plastics Industry, let us take a brief look at the materials themselves. Let us see where they come from, how they are made and used. You will want these facts before you because without a fundamental knowledge of plastics and an acquaintance with their multiple nature, they cannot be applied industrially with success.

In the beginning I said that plastics are ages old. That is true because the term "plastic" originally applied to anything capable of molding. Glass, clay, cement, metals, rubber, sealing wax and other commonly-known products possess that capability. Yet, in recent years, each has become known by its common name. These materials are no longer called plastics, except in error.

The plastics being considered here are organic plastics, made by man, without counterparts in the products of Nature. Organic plastics are modern materials. They are the result of chemical research and, being man-made, possess properties which may be widely varied and controlled.

Plastic Materials

The first plastic (cellulose nitrate), discovered by John Wesley Hyatt in 1879, was called celluloid. It is made by treating cotton linters with nitric acid and camphor, then extruding into rods and pressing into cakes which can be sliced into thin sheets before the material becomes hard. Highly inflam-



Dashboard of car with panel of "Lucile," methacrylate plastic. Instruments are adequately illuminated for night driving, yet the glare and distraction of a fully lighted dash are reduced.

Courtesy du Pont Company

mable and dangerous to handle though it was, celluloid rapidly became an industrial material of great value and importance.

Celluloid gave us our first thirty-day collar, which could be washed each night with soap and water and never visited a laundry throughout its life. This same material rapidly replaced metal in inexpensive jewelry and dresser ware; replaced rubber and bone in combs; gave us our first colored fountain pens, our first photographic film, and our first safety glass for automobiles.

Shellac molding compound became the second plastic of industrial importance when it was used by Emil Berliner, in 1895, to make phonograph records. Shellac, of course, is of natural origin, being produced by insects which live on trees in India and its vicinity. Compounded with other substances which enhance its physical properties and make it moldable, it is considered a modern plastic and is still used largely in the manufacture of phonograph records and for high-voltage insulation.

Cold molded plastics, of the bituminous type, came next. They were introduced into



Gábor Édor

New use of a new plastic by Louis Sanders who designed this hat trimmed with dainty rolled circles of silvery Vinylite. The fat, sparkling bracelet is made of the same plastic, crocheted into a tube of mesh.

the United States by Emil Hemming in 1909. Raw materials used in their composition include asphalt, coal tar, natural and synthetic resins and oils, and asbestos which contributes to their insulating value.

This type of plastic finds its greatest use where the molded parts must operate in high temperatures. Its production has diminished during recent years because other plastics, especially phenolics, are more economical to use from a production point of view.

Dr. Leo H. Baekeland discovered the fourth plastic in 1909 while experimenting in his laboratory with by-products of coal tar. He found that the gooey mass, resulting from a reaction of phenol with formaldehyde and a catalyst, could be baked into an insoluble and infusible product which proved to be good for electrical insulation.

Dr. Baekeland's discovery laid the cornerstone for the foundation of the present plastics industry. His type of plastic, known as phenolic, quickly assumed an important place in industry where it occupies the highest point of production among all plastic materials. It has found its way and welcome in many fields from buttons to automobiles; in fact, its uses are legion and altogether too numerous to attempt to list here.

Ten years elapsed before another plastic was introduced. Then came Casein plastics which were developed in the United States in 1919. Their use had been claimed in France since 1893. Casein plastics, a by-product of milk treated with formaldehyde and other chemicals, is produced in considerable quantities and used mostly in the manufacture of buttons.

From here on, one new plastic after another reached the market, usually not more than a year apart, until today, in addition to those already mentioned, we have: cellulose acetate; cellulose acetate butyrate; urea-formaldehyde; cast phenolics; polyvinyl acetate; polyvinyl chloride; polyvinyl acetate-chloride copolymer; polyvinyl butyral; styrenes; acrylics; ethyl cellulose; alkyds; coumarone-indene; and so on.

This is not intended to be a chronological listing or history of plastics but rather to point out to those interested in becoming a

part of the industry that there are many different kinds of plastic materials. Each has its own peculiar physical, chemical, thermal, electrical and optical properties which must be understood, theoretically at least, before they can be applied industrially with success.

Because of these variable properties, plastics provide manufacturers, engineers and designers with new fundamental materials which they never had before. They offer an economical and rapid method of manufacture entirely in keeping with American ideals of mass production and volume sales.

Probably the most exciting plastics, and those which have achieved the greatest amount of recent publicity, are the acrylics and styrenes. They look like glass but will not shatter as easily, weigh only half as much, may be sawed, drilled, machined, bent, twisted and cemented with fairly simple technique.

Acrylics were brought to this country originally to be fabricated into cockpit housings for airplanes, where their light weight and non-fragility permit them to serve better than any other material.

Long before production reached sufficient volume to supply that demand, designers discovered that they, too, could use these transparent plastics, because they could be fabricated more easily than glass. Active imaginations and clever hands quickly turned acrylic plastics into strange forms. Coffee tables and chairs appeared first. Then came desks you could see through, beds you could see under, even pianos which gave a clear view of their unattractive insides.

When vinyls came along, they entered the industrial market quietly and efficiently as linings for tin cans. Being resistant to attack by alcohol and food products, they made it possible for the first time to package beer in cans.

Later, a variable of vinyls, known as a copolymer, came along to give us elasti-glass suspenders, garters, watch straps, chair seats, and women's shoes.

If you have followed the progress of plastics at all in the news, you will recognize that these brief high-lights are but an indication of the implications of plastics and that many, many opportunities lie ahead.

The Plastics Industry

The several well-defined branches of the plastics industry are so closely related that one is often dependent upon the others. They are (1) the materials manufacturer; (2) the custom molder who manufactures products from molding compounds; (3) the tool and die manufacturer who supplies molds to shops not equipped to make their own; (4) press and equipment manufacturers; (5) the fabricator who manufactures products from sheets, rods, and tubes, which have been previously cast or formed to shape; (6) the laminator who impregnates paper and fabric with liquid resins and presses them into sheets, rods, tubes, gears, etc.; (7) the proprietary or departmental molder who molds plastic parts for his own exclusive use.

In some instances, two or more of the above branches are combined in one plant, but generally speaking the industry functions along specialized lines where the greatest success is based upon experience and skill.

The Chemical Branch

Practically all major chemical companies are engaged in the manufacture of plastic materials, some of which are of by-products other large scale operations. Perhaps it is wrong to designate this section as "The Chemical Branch" of the plastics industry. To state it more accurately, we should say that plastics constitutes a branch of the chemical industry. There are only a few

independent manufacturers of plastic materials who are not engaged in the manufacture of chemicals as well.

Each maintains elaborate laboratories for research, testing, and technique. The burden of progress in the industry and the performance of materials in use rests upon the manufacturer of the materials themselves. Many improvements in molding and fabricating equipment have been initiated by the mechanical branch of the industry but it has remained for the materials manufacturer to improve and develop his product to accommodate these changes, and this is no minor undertaking.

Some plastics are manufactured by comparatively simple methods of distillation and precipitation with more or less minor finishing and compounding operations. Others are complex in their manufacturing technique and require extensive compounding, grinding, blending, extruding, pressing, slicing and finishing machinery and equipment. Huge ovens are sometimes necessary to cure or polymerize the materials in preparing them for the market.

One of the greatest advantages inherent in plastic materials is their wide range of color possibilities. With few exceptions, plastics can be made in any color desired. Coincidentally, color becomes one of the greatest problems of the materials manufacturer. The range is so limitless that he frequently finds himself faced with whimsical demands.

One manufacturer, for example, has more than 2,000 color formulas in his active file, yet each year he is called upon to create from six to seven hundred new shades to satisfy changing demands. One manufacturer of sheets, rods and tubes, which vary in size and shape as well as color, finds it necessary to carry a perpetual inventory valued at more than a quarter of a million dollars in order to meet the exacting requirements of the fabricating trade.

Some manufacturers have recently announced a limited range of desirable standard colors which are available from stock. Special colors will be made only upon orders of sufficient sizes to justify their production.

Still another manufacturer offers to match any specified color and make delivery from his plant within forty-eight hours after the order is received.

The great difficulty with colors, of course, is to maintain their uniformity from one batch of material to another. It is readily understood that when a molder undertakes a contract to supply a million or more identical parts, he seldom places his order for sufficient material to complete the job. He orders enough, perhaps, to take care of his requirements for the first 30 to 60 days of the run, then reorders by an identifying number. If the second batch of material is not identical in color and performance with the first batch, then both the molder and materials manufacturer are in trouble until the condition is overcome.

Color is but one of the properties of plastic materials which requires constant and meticulous supervision during manu-

facturing operations. Any number of details which influence the strength, flow, electrical, thermal, chemical or optical properties of the materials must be forever watched.

Each batch of material compounded is checked and tested by the maintenance laboratory. Molding compounds are molded experimentally on conventional equipment to observe their behavior. Molded specimens are then checked for strength, flexibility, light fastness, moisture resistance, etc., before one drum of the molding compound is packed and shipped to a customer.

Background for the personnel engaged in the manufacture of plastic materials is organic chemistry. Sales engineers who sell the materials and service the trade are usually mechanical engineers, chemical engineers, or both.

Molding and Manufacturing

The operation of molding consists fundamentally of placing a small quantity of molding compound in a mold shaped exactly like the plastic part to be made. The mold is mounted in a hydraulic or toggle press and heated by electricity or steam. When the mold closes and pressure is applied with

Hand-made Plexiglas boat. The frame is wood and aluminum around which the Plexiglas sheets were bent and fastened with special cement. Boat draws only a few inches of water, travels faster, is unusually tractable and offers a certain resilience to rough water. It is shatterproof.



Courtesy of Röhm and Haas Company, Inc.

heat, the plastic material "flows" to every part of the mold and "sets." When the press opens, the molded parts pop out.

It is not as simple as it sounds, because of the varying properties of plastic materials. Heat "sets" some plastics but "softens" others; therefore, different kinds of molding equipment are required. Heat-softening plastics are first heated to flow, then chilled to set. Heat-hardening plastics undergo a complete chemical as well as physical change when heat and pressure are applied. The technique described is known as compression molding and may be applied to either heat-softening or heat-hardening compounds.

Another method, known as injection molding, softens the material in a heating chamber, then squirts it under pressure through a small nozzle into a chilled mold where it takes its shape as a molded piece. This method applies only to heat-softening plastics at the present time.

The greatest volume of plastic products, by far, is manufactured by custom molders. Custom molders are those who operate molding plants which convert plastic compounds into usable products for others.

The personnel involved in custom molding operations includes salesmen, estimators, draftsmen, engineers, mold designers, mold makers, press operators, besides the usual finishing, inspecting, packing, shipping and maintenance personnel engaged in any manufacturing operation.

Successful molders have an extensive knowledge of plastic materials and are intimately acquainted with their behavior during molding operations as well as in service later on. They must be able to give accurate cost estimates on complicated industrial parts, taking into consideration such factors as the cost of molds and dies, number of cavities most practical to operate, type and volume of molding compounds to be used, time cycles required and delivery dates.

Once an order is placed, the molder must

design the mold, prepare complete blueprints showing detailed specifications of dimension, location of cavities, gates and sprues, allowing of course for shrinkage and other variables of the plastic materials. He must accurately specify wall thickness of the part so it will have ample strength without waste of material, and he must provide for knock-out pins, ribs, struts, inserts and other strengthening and assembly devices.

Then, if he operates his own machine shop, he will turn the job over to his chief engineer or master mechanic who will translate the drawings into a mold of hardened steel. If not, he will place the blueprints in the hands of a die and tool maker and wait from four to eight weeks before the tool is made and production can begin.

When the tool (or die) is ready, everyone gathers around and holds his breath as it is locked into the press and closes for the first time. If it fails at any point of operation, it goes back to the die shop for alteration or repairs. If it works the first time, everyone is amazed.

Machinery and Equipment

Machinery and equipment used by the plastics industry has been developed principally by machinery manufacturers who supply other industries as well. Hydraulic presses, for example, are used by the rubber and metals industries in much greater quantities than they are in the molding of plastics. Likewise, the plastic injection machine is an off-shoot from die-casting equipment in which many refinements have been made to accommodate plastic materials instead of metal.

Extrusion presses, originally planned for the manufacture of rubber and explosive powder, are extensively revised and used in making plastics as well. The most recent hydraulic extrusion press to find favor in the plastics field, is made by a manufacturer of

machinery for the rubber industry. This type of press came into prominence recently when several manufacturers began extruding continuous strips of certain plastics to replace rattan in furniture manufacture. More than forty new presses have been installed in various places within the past few months.

Preforming presses, which measure and press molding compounds into briquets or pills to expedite molding operations, are over-size counterparts of the equipment used to make aspirin and other pharmaceutical tablets and pills.

Special machinery has been devised, of course, some of it by molders themselves, and some by machinery manufacturers who have recognized the importance of plastics as industrial materials and stepped in to supply an obvious demand. Several automatic and semi-automatic molding presses exhibit the result, and through their use, the production of plastic parts has been accelerated to keep pace with industrial needs.

Most successful among the manufacturers of machinery used by the plastics industry, are those who have devoted time and study to the highly specialized requirements of efficient molding and fabricating operations. One manufacturer went so far as to buy the controlling interest in a successful molding plant whereby he acquired valuable patent rights in existing equipment and was able to learn first-hand what improvements could be made in his own product to enable him to enjoy a share in this new market.

Dies and die-making can logically be considered under this same heading and it becomes perfectly obvious that men with a knowledge of plastic materials and a training in engineering and its allied manifestations can build a future in this field to fit their own specifications.

Fabricating and Laminating

This sub-heading designates two separate branches of the industry but since they are closely allied, we may as well consider them together. Let's take laminating first.

Laminating consists of impregnating paper or fabric with synthetic resin, then drying, assembling and pressing them into homogenous sheets. Plastics for this purpose are used in liquid forms and designated as resins. The same variables of physical properties, color, etc., are present in laminating as they are in molding. Therefore, those engaged in this industry must maintain a highly trained and skilled technical staff to supervise operations if anything like a successful product is turned out.

Laminates are available in too many forms to attempt to describe them in this brief space but their service is important in many fields. Decorative sheets are used for interior architecture, ship fire-proofing, table and bar tops, store fronts, signs and translucent lighting reflectors.

They are also made in rods, tubes, gear blanks, rocker arms, cams, helmets, serving trays and innumerable other shapes and forms.

Fabricating is the term used to designate the method used in converting laminates and other pre-shaped plastics into industrial and commercial products. Machining, drilling, sawing, stamping, bending, forming, drawing, cementing and assembling are conventional operations. Forming is sometimes accomplished by a technique which closely approaches molding, but sheet material is used in place of molding compounds.

Fabricators are usually sharply divided in their choice of materials. Those who fabricate laminated plastics seldom work with the softer cast resins or heat-softening sheets. Many laminators fabricate parts in their own plants where they have heavy

presses and heat available to shape gears, helmets and trays as well as large decorative sheets.

Other converters or fabricators stamp out millions of radio and small electrical parts on automatic machinery designed especially for that purpose.

Craftsmen among the fabricators, however, choose the softer materials which can be fashioned easily and quickly by hand or with the aid of common wood-working machinery. Plastics for this purpose are available in almost every shape, color, and kind. Their potential products are illimitable and range from tiny synthetic jewels, through all sorts of furniture and decorators' accessories, to trimming for women's hats. Yes, sometimes for the hats themselves.

This, then, is the field for creators, designers, and those who itch to make things with their hands.

Proprietary or Departmental Molding

Finally we come to that branch of the plastics industry which isn't really a branch at all. It consists of those molders who independently manufacture plastic products for direct distribution, or parts to be used for assembly in their chief manufacturing operations. Large electrical goods manufacturers illustrate the first classification; automobile manufacturers illustrate the second.

These company molders operate anywhere from a few presses to several hundred, depending upon the volume of plastic products they can distribute or consume. Their plants are among the most modern in the land. Skilled help and technicians are essential to the success of their operations and there is an increasing need for trained men in this field.

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OFFICERS FOR NAVAL AVIATION

JOHN H. TOWERS

*Rear Admiral, United States Navy,
Chief, Bureau of Aeronautics*

NAVAL Aviation has utilized two distinct methods in building up its reserve officer component. On the one hand, comparatively young and inexperienced men have been enrolled for full training courses, followed by one or more years of active naval service. Officers so trained are generally to be found in the Organized Reserve.



Rear Admiral Towers

On the other hand, the Volunteer Reserve has obtained its personnel for specialized duties from more mature individuals whose training has been received in a civilian capacity in industry. Many members of the Volunteer Reserve performed short periods of training duty from time to time as their civilian occupations and training appropriations permitted.

There is a great demand for officers of both classifications, due to the increasing importance and expansion of the Naval Air Arm. The Navy's training, in both its own schools and in cooperation with universities and trade schools which have responded generously to this urgent need, has expanded into a huge program which has no parallel in our nation's history.

The increasing demands of industry employed in National Defense upon the limited field of individuals normally qualified for Aviation Volunteer (Special service) commissions has necessitated the establishment

of more advanced training. At the present time, young men with broad engineering education and experience are being commissioned in Class A-V (S) and ordered to active duty for special aeronautical engineering courses at the Massachusetts Institute of Technology and other recognized universities. Upon completion of these courses, officers are assigned engineering duties in Naval Aviation, where the experience gained under actual service conditions cannot but develop and prepare the individual for a career along these lines. The opportunity here presented is two-fold; a volunteer officer is serving a vital need, while amplifying and broadening his own experience.

The requirements for pilot training in Naval Aviation are not as exacting. Two full years of college are required, that is, completion of one-half or more of the credits necessary for a degree. The applicant must be over 20 and less than 27 years of age, unmarried, and must pass a naval aviator's physical examination. No specific educational subjects or courses are necessary, since our educational system provides that by the time a man has completed the average college sophomore year, he will have attained the basic ability to solve the theoretical and practical demands of the flight and ground school training. As an aviation cadet the student is in a position analogous to that of a midshipman at the Naval Academy. Upon completion of the eight months' training, he is commissioned as an ensign, U. S. Naval Reserve, or a Second Lieutenant in the U. S. Marine Corps Reserve, designated a naval aviator, and continues on active duty flying under service



Official U. S. Navy Photograph
A Class in Navigation



Official U. S. Navy Photograph
Engine Instruction

conditions in the Aeronautic Organization of the Navy. It can be said without hesitation that no better flight training course exists in the world.

The college men who enter flight training in this manner have the advantages of most beneficent legislation. Pay, insurance, uniforms, more rapid promotion, a lump-sum bonus when released to inactive duty—these are but a few of the benefits. Some members of this group are selected each year for permanent commissions in the line of the Regular Navy. Their training and upkeep is expensive, the average spent on each individual during the four years of duty being close to \$20,000.

The Navy needs volunteers in naval aviation. Aviation will not obtain pilots in any other manner. It is necessary and desirable that the educational standards be

maintained in the officer corps, which must be kept large enough to meet any emergency.

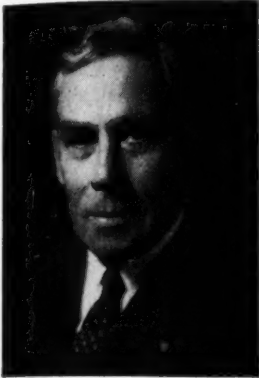
In view of the importance and magnitude of this procurement program, all Navy Recruiting Stations and numerous other naval activities are empowered to receive applications for flight training. Their geographical distribution makes it especially convenient for those who desire to discuss details and receive first-hand information. The certainty that the opportunities so offered young Americans are valuable and beneficial lends an earnest and impressive impetus to naval personnel engaged in this procurement. It is our belief that when the advantages of the training are fully realized, there will be a much greater number of applications from college-trained men which the Navy urgently needs as officers.

PRIORITIES IN MEN†

HARVEY N. DAVIS

*President,
Stevens Institute of Technology*

IN an emergency like the one we now face, every national resource must be utilized to the full. In particular, we must utilize



Dr. Davis

our human resources of trained men to the full. Whenever there is a shortage of a particular kind of human skill, the relative needs of the various users of that skill must be thought through, and priorities in men established similar to the more familiar priorities in materials.

The draft law is, of course, a major priority in itself; but it rightly recognizes the possibility of still more urgent conflicting priorities. It provides for the deferment of men engaged in essential defense industries by local draft boards, each of which is charged to use its own judgment in applying general principles to particular cases. But an enlightened public opinion must be ready to back these draft boards up. In the long run, no draft board can act with wisdom and perspective, unless the public as a whole realizes what is being done, and approves of the ends sought.

I wish, therefore, to lay before you, the public, three facts which bear on this great problem of priorities in men.

Production

The first fact, quoting Dean Condit, of Princeton, is "that the production of

weapons and ammunition is at least as important as the training of soldiers, and that soldiers without adequate military equipment are nearly helpless in modern warfare." There is no question but that our immediate need is much more for material than for personnel. At least for the present, *production* needs should outrank military needs for trained men.

A second fact is that engineers are essential to effective defense production for two reasons. In the first place, most defense production is machine shop production. There are, of course, exceptions, such as the work of housing, clothing, and feeding a draft army. But airplane engines, tanks, guns and ammunition, and a host of other things, are machine shop products, and in a machine shop engineers are indispensable as designers, as production planners, as inspectors, and in the direct line of executive responsibility. Even shelter, clothing, and food have important engineering aspects.

Another reason why defense production needs engineers is that efficient management in industry has been the special concern of the engineer for close to half a century. Most of the conscious, teachable advances in modern management have stemmed from engineers. But in skillful management lies our best hope of maximum production speedily attained. Quicker results can be obtained by improving the technique of managing an existing factory than by building a new one. The average level of industrial management in this country is far higher today than it was twenty-five years ago. Yet, few realize the amount by which this average level would be still further raised if all industrial units were as well

†Presented as a radio address by Dr. Davis over Station WOR, Newark, N. J., February 11, 1941.

managed as the best of them are. The effect on defense production would be astounding.

The third fact is that engineers are getting very scarce. This is likely to be a major bottle-neck in our whole defense program. To determine how serious this bottle-neck may be, nine engineering schools in New York recently conducted a joint quick survey of the personnel needs of the defense industries in that area. Skilled observers, in two weeks of intensive field work, secured by personal interviews with key executives in 174 industrial units, first hand data as to their expected need for engineering-trained men.¹ The results were startling. In the aircraft industries alone a need was disclosed for at least six thousand additional young engineers before next October, as against only twelve hundred to be graduated next June by all nine colleges put together. Furthermore, when the more modest needs of the other defense industries are added in, the total demand for engineering graduates this summer in this area seems certain to be at least six or seven times as great as the supply. Presumably the same is true in other areas all over the United States. The present dearth of engineers seems certain to be a major bottle-neck in defense production.

Quoting Dean Condit again, "we are well aware that a mechanized army needs engineers for its maintenance and effective utilization, but until we acquire the equipment for such an army it is the part of wisdom to use our young engineers for the production of the equipment we lack. When our military forces are reasonably equipped, it will be time enough to apportion the engineers between production and military service to the best possible advantage. In the meantime, if this country is to be the 'arsenal of the democracies,' it must use its trained men on that job."

Here, then, are our three facts. First, at the present moment, defense *production* is even more important than combat training. Second, engineering-trained men are essential to effective production. And third, engineering-trained men are already terribly scarce, and the need for more is far greater than the supply.

Conclusions

What conclusions should be drawn from these facts you, the public, must decide for yourselves. May I suggest some of my own personal opinions for you to appraise and evaluate?

First, the engineering schools must do their utmost to make more engineering-trained men available to industry, both by expanding enrollments in our regular curricula, and by emergency training of non-engineers to be what may be called engineering-apprentices, competent to perform the less technical duties now assigned to engineering graduates. This training is a defense activity of the utmost importance, and the teaching staffs engaged in it should be regarded by draft boards as properly deferable.

Second, young men about to finish their junior year in engineering would be so soon available that it may be wise to defer them until they can complete their regular training. If this is done, the colleges might well undertake to guarantee that juniors thus deferred shall spend the coming summer on some job vital to defense.

Third, young engineers graduating next June should be assigned to defense *production* rather than to combat training, unless national needs change materially in the meantime. The defense industries should ask for, and the draft boards should grant, further deferment of these June graduates if they enter defense work.

¹See also "Pennsylvania's Industrial Needs," SCHOOL AND COLLEGE PLACEMENT, Vol. 1, No. 2, p. 14. (December, 1940)—EDITOR

And, finally, industry itself should do its utmost to conserve the human resources it already has. This means classifying the work commonly done by engineers, and assigning the less technical parts of it to others. It also means keeping present engineers on engineering work. I am told that a number of companies in this area are not asking for deferment of any of their young engineers, on the ground that they are replaceable. Doubtless most young men are replaceable. And doubtless this policy impresses draft boards and the public generally as patriotic. But is not such a policy really distinctly unpatriotic? Every replacement will have to come out of a dangerously depleted pool of engineering talent; and every engineer who is hired as a replacement means one less trained man available to the defense industries. Whenever anyone lets a young engineer be drafted, and then hires another to take his place, what he is really doing is to rob some defense industry of a much needed trained man, so as to put a wholly untrained man into the draft army.

I believe that every young engineer, whose present employer does not feel justified in asking for his deferment as essential to

national defense, ought as a matter of duty, to get himself a job at once where he *will* be essential to defense production. And I further believe that his present employer should make no effort whatever to replace him, but should rather, by analysis and segregation of the types of work to be done, manage to get on without him. Along this path real patriotism lies.

Summarizing these four suggestions: first, the teaching staffs of engineering schools are engaged in an essential defense activity and should not be drafted at this time. Second, engineering juniors might well be deferred until they are fully trained. Third, this year's engineering seniors can serve the country better as employees of defense industries than as buck privates in the army. And fourth, industry itself must do its best to conserve the inadequate pool of engineering skill that already exists.

This is the sort of thing that must be thought through if we are to establish a wise system of priorities in men. Only by establishing such a system can we hope to utilize to the full our valuable human resources.

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PLACEMENT—1940

A survey of the Placement of Graduates of the Class of 1940

THIS study, intended to be representative of the member institutions of the Pennsylvania Association of School and College Placement, is based on the results of a survey conducted among twenty-five institutions of higher learning. Lack of facilities in the Executive Offices of the Association made it necessary that sample questionnaires be sent to representatives at the various member institutions, and that we depend for the completion of the survey upon their cooperation. The spirit in which the various colleges fell into line with the proposal of the survey was gratifying and only the limited time allowed for making the study and the unusual pressure put upon many of the technical schools by special defense activities prevented our having a more representative sampling.

Although by including all member institutions in the request for cooperation the survey should have given a national cross-section of placement for graduates of 1940, the actual returns are limited to those made by institutions in the eastern industrial section. With the exception of Cornell University, which is located in Ithaca, New York, all of the institutions participating are located in Pennsylvania.

Another factor which has colored the results is the omission of figures from such representative institutions as Stevens Institute of Technology, Lehigh University and Massachusetts Institute of Technology. All of these are active in the training of engineers, chemists and others participating in the current defense boom. Also missing from the roster are the important western, mid-western and south-western institutions, and the large state colleges. A complete list of the college and university members of the Pennsylvania Association of School and College Placement, all of whom should rightly have been represented in this study,

appears on the inside back cover of this issue.

Of 4,370 questionnaires sent out to graduates of June, 1940, approximately 2,950, or 67%, were filled in and returned. The participating institutions each tallied the reports of their own graduates, and the master forms were then sent to the Executive Offices of the Association.

Taking the 67% return as a fair sampling, and without dividing the various institutions into groups such as technical, liberal arts, women's colleges, and the like, it was found that 71% of the graduates of June, 1940, were employed at the time of the survey. Another 22% indicated they were engaged in graduate work. These figures may be weighted slightly one way or the other by several variations in the methods used to obtain them. In the case of Cornell University, for instance, the questionnaire was sent only to those male undergraduates of the liberal arts college who had not, to the knowledge of the placement authorities, gone into graduate work. As it happened, 32% of this group *had* enrolled for graduate work. Another factor which weighted the returns from Cornell was the omission from the survey of graduates of the engineering school. Mr. Herbert H. Williams, Director of the University Placement Bureau, reports however that all graduates of this college, as well as all graduates in veterinary medicine, are employed. Figures are not available for those holding degrees in home economics, agriculture or architecture. It is entirely probable that, were the survey complete, including returns from these groups, the percentage of employment for Cornell would appear considerably higher than it does.

Although the figure obtained for graduates who are employed is 71%, this does not mean that a full 29% are *unemployed*. Even

were the figures upon which this survey is based absolute, we would find nearly 22% of last year's graduates participating in advanced or professional studies. In a number of cases also, women graduates have married and although they hold no positions they are not seeking gainful employment.

In obtaining the figures from the individual members of the graduating classes, no differentiation was made between those who are taking graduate work full-time, and those who are taking it in addition to holding a position. It is likely, however, that the number who are employed and taking graduate work concurrently will at least compensate for those graduates who have definitely gone on into graduate or professional school, and who were in some cases omitted entirely from the survey.

Another factor which may have weighted the findings considerably is the ever-present possibility of draft call. Although the figures were entirely omitted in some of the returns, from the numbers quoted as eligible for, or in training under Selective Service, or holding commissions in the Armed Forces, it would seem that based upon findings of seventeen of the twenty-five institutions (five of them are women's colleges exclusively), at least 47% of the male graduates of 1940 are in the first group and 6% in the second. Also to be considered is the possibility that some of the forms were not returned by individuals who are now serving with the Armed Forces, either because of delay in forwarding the blanks or because they did not consider their present occupation "employment." The entire picture of the eligibility of last year's graduates would undoubtedly have been changed considerably had returns been complete and accurate, and if the various state colleges and the large land-grant colleges of the mid-west and the southwest were included. The Agricultural and Mechanical College of

Texas, for instance, has almost all of its 6,500 under-graduate students participating in R.O.T.C.

It is still a man's world so far as remuneration for employment is concerned. The average starting salary for men graduates of the class of 1940 was \$110.19 a month, whereas the average for women was only \$92.37. The highest salary reported for men of this class was \$150.00 per month for an engineer, but this amount was questioned by the administrator conducting the survey for that particular institution. The highest salary reported by a woman was \$130.00 a month for teaching.

It is interesting to note that Drexel Institute of Technology reports the monthly earnings of graduates of its two-year Secretarial Course averaged \$69.87 to begin, and the earnings of graduates of the four-year Secretarial Course averaged \$80.16.

Albright College

Forty-five percent of the 84 questionnaires sent out were returned. Of this sample, 50% are employed (44% of the men, 55% of the women), and 39% are pursuing graduate studies. Of the entire sample, 34% have found employment in the field for which they prepared. The average starting salary for the men was \$116.00 a month, and for women, \$112.00 a month. Two-thirds of the male graduates are eligible for Selective Service.

Allegheny College

Of 128 questionnaires sent out, 68% were returned. Based upon this sampling it would appear that 54% of the entire class (53% of the men, 55% of the women) are employed, and 33% of them are taking graduate or professional work. Thirty percent of the class is employed in work relating to the major field studied in college. The average starting salary per month was \$99.63 for men, and \$80.81 for women. No

figures are available for the men eligible for or in training under Selective Service, but the administrator who conducted the survey reports that the majority are eligible.

Beaver College

One hundred thirty questionnaires were sent out, with a 90% return. Sixty-two percent of the women reported they were employed, and 14% are engaged in graduate work. Fifty-three percent of the graduates are employed in work relative to their field of major study. Starting salaries averaged \$100.00 a month.

Bucknell University

Sixty-eight percent of the 278 questionnaires sent out were returned. Based on this sampling, 68% of the graduates (72% of the men, 62% of the women) report being employed. Twenty-nine percent are in graduate work. Forty-seven percent of the class is doing work for which they prepared specifically in college. The starting salary per month for men was \$104.46, for women, \$82.38. Twenty-seven percent of the men are eligible for Selective Service, according to the returns, but it seems likely this number is considerably underestimated.

Carnegie Institute of Technology

Of 495 questionnaires sent out, 89% were returned, indicating a 95% placement of last year's graduates. One hundred percent of the men and 86% of the women report being employed. This high figure may result in part at least from the fact of the institution's being a technical school, whose graduates are in special demand at the present time. Eighty-nine percent were in work for which they had prepared in college, and 3% report being engaged in graduate work. The starting salaries of men averaged \$126.00 a month, of women, \$96.00. Forty-two percent of the men are eligible for

Selective Service and 14% hold commissions in the Armed Forces.

College of Chestnut Hill

Eighty-nine percent of the 55 questionnaires sent out to graduates of the College of Chestnut Hill were returned. No figures were quoted on the total percent reporting employment, although it was indicated that 57% of the class had found work relative to the field of major study in college, and 4% were taking graduate or professional work. The average starting salary was \$80.00 a month.

Cornell University

Ninety percent of the 134 male graduates of the Liberal Arts College returned their questionnaires. The sampling indicates that 65% of them are employed, and 32% are taking graduate work. The average monthly starting salary for this group was \$95.59. No figures are available on the percent of them who are eligible for Selective Service, nor on the number who are engaged in work for which they especially prepared during their undergraduate days.

Dickinson College

The percentage of returns (91) of the 116 questionnaires sent out indicates that 27% of the Class of 1940 (26% of the men and 31% of the women) are employed, 9% of them in the field of study in which they majored. Fifty-six percent are engaged in graduate work. Those who are employed report an average starting salary for the men of \$110.33 and for the women of \$94.63. No figures are available on the number of men eligible for Selective Service, but about 2% of the male graduates of 1940 hold commissions in the Armed Forces.

Drexel Institute of Technology

Seventy percent of the 329 questionnaires were returned. They indicate that 99% of

the men and 94% of the women graduates were employed, 91% of the class being engaged in work relative to the major study. Ten percent are taking graduate studies. The average starting salaries were, for men \$113.34, and for women \$94.21. Seventy-four percent of the men are eligible for Selective Service, and 21% hold commissions.

It is interesting to note these figures in comparison with the returns of some of the other institutions. Drexel Institute is a technical school, and the figures apply to graduates of the School of Business Administration (in which there are two separate Secretarial Courses offered), the School of Home Economics, the School of Engineering, and the School of Library Science. Graduates are all technically trained individuals, and their earnings and employment status cannot well be compared with graduates of liberal arts colleges who are relatively unskilled in any field.

Franklin and Marshall College

Thirty-one percent of the 136 graduates questioned responded. The returns indicate that 60% of these men are employed, 38% in the field of their major. Forty-five percent of the class is engaged in graduate or professional training. The average starting salary for those employed is \$102.00 a month. Eighty-six percent report eligibility for Selective Service, and 7% hold commissions. The figures for this institution, again, bear fuller explanation. Like all liberal arts colleges, Franklin and Marshall prepares large numbers of students for advanced study in such fields as law, medicine and theology. Therefore, the response to the questionnaire may be somewhat weighted by the failure of a good proportion of the graduates to return them. Graduates who are not personally interested in employment have a tendency to regard any such questionnaire relative to placement

with less seriousness than their class-mates who are looking for, or have found, work.

Haverford College

Another liberal arts college, Haverford reports 65% return of the 63 questionnaires sent out. Of the sampling, 51% report employment, 27% in the field for which they prepared. Sixty-one percent of the class is pursuing graduate work, full- or part-time. The starting monthly salary for the group employed was \$91.00. Sixty-six percent report being eligible for Selective Service.

Juniata College

Ninety-nine percent of the 88 students questioned regarding their employment status, replied. Sixty-two percent of the men and 83% of the women are employed, 61% of them in the field of their major. Twenty-four percent are in graduate or professional schools. The average starting salary for both men and women was \$106.00 a month. Ninety-six percent of the men report being eligible for Selective Service.

Lebanon Valley College

Of 98 questionnaires sent out, 54% were returned. Sixty-one percent of the men and 53% of the women report employment, 32% in the field of their major study. Thirty percent are taking graduate work. The average starting salary for men was \$133.33 and for women, \$103.83. Ninety-four percent of the male members of the Class of 1940 report eligibility for Selective Service, and the other 6% hold commissions.

Moravian College for Women

Eighty percent of the 35 questionnaires sent to last year's graduates were returned. They indicate that of this sampling 79% are employed, 39% of them in their field of preparation. Seven percent are undertaking graduate work. The starting salary for these

women who are employed averaged \$77.36 per month. No one who prepared for teaching is located in that type of work.

Mount Mercy College

Forty-two questionnaires were sent out, and 50% returned. Sixty-seven percent of the sample were employed, 57% in the work for which they have prepared. Twenty-four percent of the class, according to the sample, were taking graduate or professional work. The average monthly starting salary for those employed was \$100.00.

Muhlenberg College

Of 31% of the 153 graduates of June, 1940, to whom copies of the questionnaire were sent, 56% indicate they were employed at the time of the survey. Forty percent are engaged in work for which they prepared. Forty-four percent of the sample are pursuing graduate or professional training. The average monthly starting salary for the men was \$106.68. The six women answering the questionnaire reported salaries of \$135.00 per month, but this has been omitted in finding the average, as these six were all extension students who were employed while they were studying. Forty-eight percent of the men indicate eligibility for Selective Service. One member of the class is now at West Point.

St. Joseph's College

The sampling of the Class of 1940 of St. Joseph's College is based on only 17% return of 97 questionnaires. This limited return indicates that 94% of the men are employed, 38% in work for which they prepared. Thirteen percent are engaged in graduate work. The starting salary averaged \$93.44. Ninety-four percent of the students in the sample are eligible for military training and the other 6% hold commissions.

St. Vincent College

Thirty-five percent of the forty questionnaires were returned. Based on this sample, 64% of the students appear to be employed, 29% in the field of their major study. Fifty percent are pursuing graduate or professional studies. The starting monthly salary for those employed averaged \$101.00. No figures are available on the number of these men eligible for military training, but 7% of the sample hold commissions.

Seton Hill College

Fifty-one percent of the 72 women to whom the questionnaires were sent returned them. This group indicates that 38% are employed, 27% in the field of their major study, and 41% are taking graduate work. The average monthly salary received at the beginning of employment was \$100.00.

Temple University

Of 69% of the 641 undergraduate members of the Class of 1940 who participated in the survey, 78% of both men and women were employed. Sixty percent of them were engaged in work for which they had specifically trained. The percentage engaged in graduate work was 17. The starting salaries reported averaged \$130.00 for men and \$95.00 for women.

University of Pennsylvania

Forty-nine percent of the 745 graduates of the College of Liberal Arts, the College of Liberal Arts for Women, the Towne Scientific School, the Moore School of Electric Engineering and the Wharton School of Finance and Commerce responded to the questionnaire. This sampling indicates that 78% of the men and 38% of the women had found employment, and 18% were engaged in graduate work. The starting salary for the men averaged \$129.00 for graduates in Electrical Engineering, \$124.13 for gradu-

ates of the Towne School, \$95.26 for Wharton graduates, and \$91.60 for Liberal Arts graduates. Women averaged \$66.94 a month. It is important to note that due to the Five-Year Course in Education, those members of the School of Education who received their degrees in 1940 are not included here, as their course was not completed. Therefore, no salaries for teachers are included in the figures upon which the average monthly salary of Liberal Arts graduates (men and women) was based. The amount given here refers to those who received no specific vocational training. No figures were available regarding Selective Service, but 4% of the men hold commissions.

University of Scranton

Eighty-seven percent of the 122 graduates reveal that of their number 58% are employed, 37% in the field for which they prepared. Twenty-five percent are taking graduate work. The average monthly starting salary of those working was \$122.00. Seventy-eight percent of the men are eligible for Selective Service.

Ursinus College

Eighty-one percent of the 131 graduates who were asked for information responded. This sample indicates that 76% of the men and 53% of the women are employed. Twenty-seven percent of the graduates are

taking advanced work. Forty-two percent are working in the field for which they studied. The starting salary for men averaged \$108.80 and for women, \$75.80. The sampling indicates 86% of the men are eligible for military training, and 4% hold commissions in the Armed Forces.

Washington and Jefferson College

Ninety-two percent of the 104 questionnaires were returned. This large sample of the Class of 1940 indicates that 41% of the men are employed, and 51% are taking graduate work. Twenty-six percent of the class is engaged in work relative to the major studies in college. The starting salary averaged \$106.38 a month for these men, 95% of whom are eligible for Selective Service. Five percent of the class hold commissions.

Waynesburg College

This is the only institution to have a 100% response to the questionnaire. Sixty-eight percent of the men and 69% of the women graduates were employed at the time of the survey, 61% in the field for which they had prepared. Fifteen percent were taking advanced studies. The starting salaries averaged \$121.36 a month for men and \$88.54 a month for women. All of the men who graduated in 1940 are eligible for military training.

TEACHER SELECTION†

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THE selection of teachers has been assuming an increasing amount of importance during the last few years. The



Dr. Williams

problem has become more acute for boards of school directors and also for the higher institutions of learning in which teachers are educated. A number of factors have combined to create the present situation which causes the selection of candidates for teacher education and the ultimate employment of teachers in public school positions to loom so large in our American public schools. Among these factors are: (1) a lessening demand for new teachers and a consequent increasing supply of available people; (2) the general economic situation which makes the relative security and steady pay of a teacher more attractive; and (3) tenure legislation which results in teachers remaining for longer periods in the same positions.

This latter factor, the tenure legislation, has occasioned serious consideration among the school directors of many states. Even though there is provision for a probationary period during which a newly employed teacher is classified as a temporary professional employee, the school directors are quite apprehensive lest they make an unfortunate choice. School directors, with the professional advice of superintendents and

supervising principals, are making more careful analyses of teachers' qualifications. All officials and school directors are anxious to avoid the development of a situation in which a mediocre teacher must be retained in the school system merely because she is not quite poor enough to be dismissed as incompetent in accordance with the provisions of the tenure act.

Teacher education institutions are also concerned with the problem. Teacher placement officials in the institutions are cooperating with the school directors in making available more complete information concerning the qualifications of candidates. These cooperative efforts would doubtless result in a wiser selection of teachers if the systematic efforts of both groups were better understood. With that thought in mind, we are presenting in the paragraphs that follow the essential steps in what might be termed a four-point program of teacher selection. This program is typical of the better teacher education programs to be found throughout the country.

Admission to College

Students who desire to prepare for teaching as a career are admitted on the basis of analytical and diagnostic tests that furnish evidence concerning their prospects for success in professional study. Such analytical studies are replacing the traditional college entrance data.

School directors and school officials have observed with much interest the changing situation with regard to admission to college. Admissions officers have been less concerned in recent years with what students have accomplished in high school and have been

†This appeared in substantially the same form in the *AMERICAN SCHOOL BOARD JOURNAL*, August, 1940.

more interested in the promise of ultimate success exhibited by an applicant. This is particularly true in the higher institutions that concentrate their efforts on teacher education.

A brief summary of the characteristics which teacher education institutions desire in their students will serve to illustrate the shifting emphasis in college entrance procedures. Among the qualities used as a basis for selecting prospective teachers are vigorous health and absence of physical defects; superior intellectual ability; social and personal qualities essential for success in teaching; specific aptitudes for dealing with children; record of participation in extra-curricular activities; proficiency in English usage.

The composite picture of an applicant obtained by close attention to these qualities is useful to admissions officers in determining who should be encouraged to prepare for teaching. There is no place in the school-room for neurotic, pessimistic, antisocial people for whom teaching is simply another job. There is no desire to insist that all teachers be of the genius type mentally, but it has been demonstrated that persons of low average intellectual ability have difficulty in making the many adjustments necessary for success in teaching. School officials are agreed generally that the most important step in the education of teachers is the selection of candidates for admission to the colleges.

Student Guidance

As a student pursues the teacher education curriculum that will lead to a degree and a teacher's certificate, he is periodically in contact with a sympathetic adviser who assists him in continuing the analyses of his possibilities and limitations as a prospective professional worker. A student's peculiar aptitudes are studied with a view of determining the particular area in teaching in

which he gives the greatest promise of success.

The typical guidance program for prospective teachers includes the assignment of a small number of students to a faculty member who will serve as an adviser through the student's college career. The adviser seeks to become well acquainted with the student so that they can discuss the student's problems confidentially and simply. The adviser has at his disposal the results of a variety of tests and other analytical measures. A vocational interest test is used to determine whether the student has an inclination toward teaching. The various orientation courses assist him in determining, with the help of his adviser, what field of specialization shows greatest promise of success. The personal and social problems that are the cause of failure for many college students are met with a more objective and analytical attitude. Or if this latter statement is not true, the adviser has at once a good reason for attempting to guide the student away from the study of education as a career.

The guidance function in teacher education institutions looms large as one of the important activities. The traditional notion that the teacher needs only to be a master of a given subject-matter field has definitely been superseded by the concept that the teacher is a person, an individual with a challenging personality who is a leader and guide for children, not a mere dispenser of knowledge or purveyor of subject-matter. In our better teacher education institutions as much attention is given to an analysis of the student and his potentialities and limitations as is given to the content of the courses he studies.

Teacher Placement

School officials are assisted in assembling information concerning the qualifications of teachers by the well organized teacher

placement offices in the institutions. An increasing amount and variety of information is available to school officials if they will but request it.¹ If school directors could avoid local pressures and personal drives for positions, there would be little excuse for making mistakes in the selection of teachers, in view of the pertinent information available in placement offices.

It is quite common practice for the teacher placement activities to be coordinated with the admissions and guidance functions so that a complete picture of the applicants for teaching positions can be made available to prospective employers. From the point of view of the teacher placement office the chief difficulty is to get school officials, and particularly school directors, to seek the assistance of the placement office. It is true that in many situations the local school officials are literally swamped with applicants for a given position, and that consequently, they feel it is not necessary to seek additional information from college officials. Many unfortunate choices would be avoided if school officials could be encouraged to make use of the exhaustive information that is available in placement offices. The institutional placement offices certainly know the candidates for teaching positions better than any other agency that is interested in their placement. The primary objective of the placement officials is to assist school superintendents and school directors in finding the best qualified teachers. Helping the graduates of their institutions to secure positions is subordinate to the desire to get thoroughly competent teachers into specific school positions.

Follow-up Service

Probably the step in the process that gives most promise of bringing the institutions and the employing officials together is the

systematic follow-up program. The institutions engaging in such activities send one or more staff members into the schools during a teacher's first year of service to visit the class and confer with the local supervisors. As a result of this conference, many beginning teachers are assisted in arriving at a satisfactory adjustment to the complex responsibilities of teaching at a much earlier date than would be possible otherwise.

It is through the follow-up program operated by a college that the faculty members are kept in closest touch with those areas served by the graduates. One of our mistakes over a long period of time has been the assumption that teachers are a ready-made product, able to step into any situation and make a complete success from the beginning. That is not true. Even when one purchases a standardized mechanical product, such as an automobile or refrigerator, it is almost always necessary to make minor, sometimes major adjustments. In the complex relationships of teaching it is even more vital that machinery be set in motion that will make the persons responsible for the education of teachers follow them into actual positions in the schools. This is particularly true in the states that are operating tenure laws. The faculty members who visit the recent graduates may help the beginning teachers over those early, rough spots in the teacher's career. Or if the probationary teacher is getting off to such a poor start that his future success is seriously jeopardized, the teacher may be persuaded to pull out of the situation and not attempt to stand on his tenure rights. It is frequently possible for a person who gets off to a poor start in one place to make a better adjustment in a new environment. The institutions that have embarked upon a serious follow-up program have been convinced of its value and the soundness of the

¹See "Credential Requirements of School Administrators," *SCHOOL AND COLLEGE PLACEMENT*, Vol. 1, No. 3, pp. 43-48 (March, 1941)—EDITOR

follow-up service as one of the steps in the teacher education program.

The attention of school directors is invited to some of the more important considerations involved in the selection and education of teachers. In the days when there were fewer teachers available than there were openings, the problem of the school director was to find some person who

could be persuaded to accept the position. The problem now is selection of the best qualified candidate. It is the hope of the writer that the employing officials who must make the selection may be brought into more harmonious relationship with those in the institutions where the teachers secure their education and qualify for certificates.

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VOCATIONAL GUIDANCE, TRAINING AND PLACEMENT OF THE HANDICAPPED

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EVERY year nearly one-tenth of the people in the United States meet with accidents, and twice as many suffer loss of



Mr. Walter

time from work through illness. Consequently, there are 4,000,000 persons with permanent physical impairments, and the annual increment of new cases is about 800,000. The disabilities of about 67% of these do

not prevent them from making their own employment adjustments. For the other 260,000 it is necessary to provide a special service of guidance, education and placement in order that they may engage in remunerative employment. About 30% of these can be prepared for normal employment, and the rest must be adjusted through a special environment such as sheltered workshops or occupations which can be carried on in their homes.

The salvaging of the handicapped is an important factor in human engineering, yet prior to 1850 society did practically nothing to cope with the problem. In fact, in the early days of civilization the disabled were held in contempt, for it was believed that a physical impairment was a punishment for a wrong done against the Deity.

Attempts at social justice for the handicapped began with the development of charity organizations, and the establishment

of hospitals for crippled children in the larger cities. Special schools and classes are now provided in the public schools and by the State for the deaf, the blind and for those with orthopedic disabilities.

The needs of the injured adult were not recognized, in the United States, until 1900. This movement began with the passage of workmen's compensation laws, designed to compensate the worker for an injury or functional loss of a part of his body. No attempt was made, however, to return him to employment. Next came the development of the safety movement to reduce the cause of accidents. Then, following the World War, the federal government undertook active rehabilitation by restoring some 128,000 disabled veterans to economic independence. In 1920 the National Civilian Rehabilitation Law was enacted providing for the rehabilitation of disabled persons of employable age and capable of earning a living. Since then all of the states have accepted the provisions of the federal law; more than 125,000 persons have been re-established in employment, and 45,000 are in the process of rehabilitation today.

Vocational Guidance

Vocational adjustment of the disabled presupposes a careful analysis of the potentialities of the individual, as a basis for the selection of a proper job objective and preparation for the realization. The approach to this analysis requires a reconsideration of the philosophy of vocational guidance.

The problem of vocational guidance was first interpreted as one of fitting "square pegs in square holes" and "round pegs in

round holes," it being the theory that there was one "best" job for each individual. Occupations were more or less constant, the changes that did take place were gradual and required few adjustments on the part of the workers. It was felt that each person should do the type of work for which nature endowed him. All that was necessary was to analyse the abilities of the individual and then select an activity suited to them. There was a sense of security due to the slow rate of change in economic life.

Today vocational guidance must be given a wider interpretation. It now involves the complete adjustment of the individual, physically, educationally, socially, spiritually, vocationally and morally. This broad interpretation in its application to the handicapped is concerned with the development of employability in its physical, mental and emotional aspects. It covers the adjustment of a person to a *zone of activities* rather than one single endeavor. Otherwise the individual will find increasing difficulty in meeting the constant changes in modern industrial and commercial life. The machine era with its technical advances, displacement of workers, constant changes in occupations, and intense competition, requires greater versatility among workers, and the services to the handicapped must be adjusted to meet these conditions.

The success of a program of vocational guidance depends in large part upon the professional preparation and the efficiency of the counselor, and the opportunities for employment. He must be able to distinguish between vocational guidance and vocational advisement, and also differentiate between individuals who are interested in things and those interested in objects; between those who are mechanical-minded and those who are hand-minded; between those who prefer to work with ideas and ideals, and those who wish to work with people. He must be qualified to make such an analysis of his

subject, and then select an objective and a training program to fit the level of educability and employability of the potential worker, limited only by the severity of the worker's disabilities, the possibilities for employment, and the facilities available for realization of the objective.

There is no formula for preparing a given case for employment. When a disabled person is referred to an employer he is certified as one who is physically and mentally capable of doing the job. Therefore, the first step in the process of rehabilitation involves an analysis of the physical condition. The medical diagnosis is then evaluated to determine the employable assets and limitations of the handicapped, and to guide the counselor in the selection of types of employment which will not become occupational hazards. If there is need for further medical treatment or hospitalization this matter must be considered before continuing with the study of the case.

The second phase of the program is to aid the individual in selecting an employment objective suited to his physical, mental and emotional characteristics. Here a careful analysis of the person's aptitudes and abilities is required in order to determine the level of educability and employability.

A young man, serving an apprenticeship as a tool and die maker, lost his left leg below the knee, as the result of a public accident. Rather than dismiss him, his employer appointed him gate tender. During a visit to the plant a representative of the rehabilitation service learned of the case, and after interviewing the boy recommended that he be returned to his former work, since he had the mental and physical capacity to continue with his apprenticeship, despite his handicap. Today the young man is a happy and successful workman.

Training

Guidance through training plays an im-

portant part in the rehabilitation of the handicapped. A case in point is that of a printing press man, 38 years of age, who had caught his right hand in the press, so badly injuring it that he was awarded an 85% loss of use. For over two years he remained unemployed. An examination then indicated the client had all the necessary anatomical structures remaining for function in his hand, and suffered from traumatic neurosis rather than an organic disfunction. It was recommended that the functional loss could be almost entirely eliminated by proper work and treatment and mental adjustment.

By indirect method the client was encouraged to spend some time in the print shop, tying bundles, padding and so on. The first three days he spent criticizing the shop, but finally he became interested in the arrangement of the type in the cases. Next he made a chart of the case, printed it, began

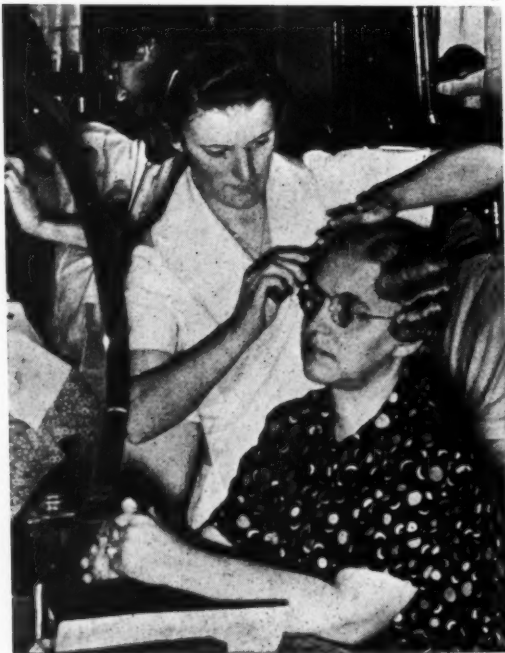
to set type, learned composition, and operated the job press. His confidence and press ability returned gradually, and he is today as good a printer, if not better, than before his accident.

Vocational instruction is a major service for about 60% of the people restored to economic independence. The feasibility of a training program depends upon the kind of employment objective which has been determined for the person; his level of educability; the type of program which will prepare him for employment in the shortest possible time consistent with his age, learning speed and job objective, at the most economical cost consistent with adequate preparation; availability of training facilities; conditions under which the candidate for rehabilitation must take his training; employment conditions to be met, including personality requirements of the job, ability of the person to profit by a comprehensive program of instruction which will prepare him for a zone of activities; and his ability to learn not only the skills and knowledge required for the job, but also something of the technique of looking for and landing a job.

The preparation of a large number of people is limited to vocational training which is primarily concerned with the development of motor responses. On the other hand, those with intellectual capacities should be given courses which involve acquisition of habits, skills and attitudes essential to complete mastery of an activity.

It is easy to lose sight of the ultimate goal and be influenced by the desires of the registrant to obtain an earning capacity by short-cut methods. However, the reverse is also true. Many programs for the physically handicapped have been unsuccessful because of the failure on the part of the service to bring the activity down to the level of employability of the client.

Although many institutions offer courses



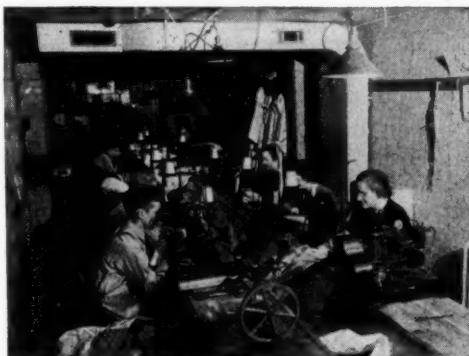
Courtesy Pennsylvania School for the Deaf
Training in Beauty Culture

for the handicapped, training on the job is an excellent means of instruction in many cases. In this connection the smaller industrial establishments and service groups of occupations, which statistics show employ the greater number of workers, offer unusual possibilities for employment training and placement of the disabled. Unlike the large plants with time limits set for schedules of production, the small business provides an environment conducive to sound, efficient training, easily adjustable to technological changes. Then too, training in these enterprises offers an unusual opportunity to fit clients for zones of activity. Such occupations as shoe repairing, watch and jewelry repairing, engraving, typewriter mechanics and other jobs of a mechanical nature lend themselves to this type of training.

Frequently individuals who are normally able to carry on their occupations and meet the changing requirements of industry encounter a technical handicap following a disability which, together with the physical impairment, makes the problem of adjustment difficult. Generally these individuals can be adjusted through courses providing technical instruction in the nature of job improvement.

There is a close relationship between the physical disability and the mental status of many of the clients; the establishment of a well-balanced emotional response is of paramount importance.

A striking example of the effect of lack of emotional control was the case of a young miner who lost his sight as a result of a mine explosion. During his training he developed a serious prejudice against the principal of the institution in which he was receiving his instruction. A psychiatrist was consulted, and it was discovered that an indirect cause of the condition was the fact that the man was being trained in an activity requiring the use of his finer sensory motor responses. An adjustment was made in his training



Courtesy Craftworkers Guild

*Power sewing machine operation
by the handicapped*

program which brought into play the heavier muscles; the emotional difficulty was overcome and the man successfully completed his training and was placed in a remunerative occupation.

Another case of emotional disturbance was that of a college freshman who suffered the loss of his right hand. He developed an emotional sensitiveness toward his disability and became fearful concerning his future success. He hinted of contemplated suicide. The matter was brought to the attention of a psychologist in the institution in which he was enrolled, and a series of conferences were arranged during which his problem was adjusted satisfactorily.

Placement

The arch-stone of the entire program is the placement of the rehabilitated clients. The employment of the disabled in tasks they are competent to perform is in accord with wise social economy and it is here that the cooperation of employers and the public is so essential.

The nature of the disability often requires the selection of special types of productive employment and the utilization of small business projects. However, there are many



Courtesy Metropolitan Philadelphia Society for Crippled Children, Inc.

examples of disabled persons fitting into regular industrial activities in competition with normal people. Today more than 10,000 handicapped persons are employed by the Ford Company, and about 8% of the employees of the Western Electric Company are physically disabled.

The latter Company made a study of the disabled employees and found that from the point of view of absences due to sickness, accident and personal reasons, stability and labor turnover, this group had a better record than normal workers. This would tend to discredit the discrimination of many employers against hiring handicapped persons. The findings of the Western Electric Company were verified in a study made in Pennsylvania in 1937. It was found at that time that of the 29,000 handicapped drivers of automobiles in that year, only 175, or .06%, had been involved in accidents. Of

the 2,000,000 un-handicapped drivers, 91,000 or 4.5% had met with accidents.

Dr. C. D. Selby, Medical Consultant of General Motors, stated in a recent report: "The problem is, can the applicant for the job do the work efficiently and safely; safely to himself and to his fellow workmen." This requisite of doing the work efficiently and safely, both to the worker and to his associates, is equally important to the disabled person and to his un-handicapped fellow-worker. If the handicapped person is selected for his abilities, and is not placed in a job where his deficiency will penalize him, he will be able to compete successfully and stand the pace of modern production just as well as those suffering from no handicaps.

History is replete with cases to whom adversity in the form of a handicap was a challenge to fight and who turned misfortune into a blessing. In several states it is

customary to check each case one year after rehabilitation. Studies show that 90% of the group are still employed, and at least 40% of them at an increased wage, after twelve months. Economically, the investment by society in rehabilitating the handicapped is sound. It has been found that for every dollar spent in this cause, \$47.00 has been returned to society. In other words, a vocationally prepared and employed disabled person becomes a self-supporting, independent and self-reliant member of society and relieves the taxpayer of the bur-

den of paying the costs of indefinite periods of institutionalization at public expense of indigent unemployed disabled persons.

The rapid expansion of production in the National Defense Program has increased the demand for workers and employers are now asking specifically for qualified disabled persons because they are not apt to be called for military service, because of the need for skilled workmen, and because of the recognized efficiency of disabled experienced workers.

WHAT is next for me? High school and university students are asking that question. They want a full and rich life. They turn toward schools of medicine, law, engineering, business, nursing, social science, and other vocations as a means to such life.

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UNIVERSITY OF PITTSBURGH

INDUSTRIAL HYGIENE AS A CAREER

THEODORE HATCH

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THE "lucifer" match, once a standard household commodity, was legislated out of existence some thirty years ago because the phosphorus used in its manufacture produced in the workers an incurable disease known as "phossy-jaw." Fortunately, satisfactory matches could be made of other non-poisonous materials and the problem was therefore solved in a satisfactory manner. In more recent times a somewhat similar disease occurred among workers engaged in the painting of luminous watch dials, the toxic substance in this case being a radio-active salt. In the solution of this problem, however, the use of radium was not prohibited but through the application of modern principles of industrial medicine and factory hygiene the work has been made safe. Similarly, many other toxic materials are employed or generated in modern industrial plants with little or no hazard to the health of the workers because of the effective control measures that are applied.

The discovery, evaluation and control of the specific occupational health hazards constitutes an important part of the work of a group of specialists known as industrial hygienists. This profession, which includes physicians, chemists and engineers, is not a new one. Until recent years, however, it numbered among its members only a small group recruited largely during the World War when the rapid expansion of industrial activity, particularly in the manufacture of chemicals, brought into sharp focus the special problems of health protection among industrial workers. Ironically enough, some of the most important problems were associated with the manufacture of TNT and other explosives!

The further expansion of industry since the World War years and the recent advances in legislation for the protection of industrial workers, particularly the general extension of Workmen's Compensation Acts to include compensation for occupational diseases as well as accidental injuries, again served to emphasize the problems of industrial hygiene and greatly increased the demand for engineering, chemical and medical specialists in this field. The objectives of the industrial health service have expanded even beyond the limited scope of control of the specific occupational diseases and now include as well the improvement of the general health of the industrial worker. Industrial hygiene has become an accepted part of the public health program.

The Division of Industrial Hygiene of the U. S. Public Health Service has been the leading organization in the development of the field and now maintains a large research and field staff engaged in the study of many important health problems in industry. Within industry itself, the medical department which emphasizes the prevention of occupational diseases and the general protection of the workers' health, rather than the mere treatment of the injured worker, has become an essential part of the progressive organization. Casualty insurance companies have also established special industrial hygiene services to assist their policy holders in the control and elimination of industrial health hazards. Similarly, state departments of public health and of labor, and even municipal health departments, have set up divisions of industrial hygiene with specially trained personnel for direct service to industry. At the present time industrial hygiene divisions are functioning in 31 state



Light beams in a dusty atmosphere may produce artistic effects but indicate inadequate plant hygiene

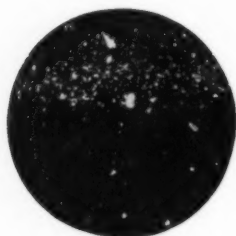
will terminate with the special defense activity which initiated it. In keeping with the experience following the World War, however, and in line with modern social trends, it may be safely predicted that many of the advances will become permanent. Of great importance in this connection is the fact that an effective industrial health service is found to be an asset rather than a financial burden and is rarely given up after being installed in an industrial organization.

Opportunities in Industrial Hygiene

Because the industrial hygiene profession is relatively new, one cannot discuss in quantitative terms the opportunities which it offers as a career. One has only to reflect, however, upon the magnitude of the industrial plant in the United States to visualize the extent of the work to be done. Approximately 15 million workers are employed in more than 200,000 American factories and mines. About 25 percent work in approximately 1,000 plants employing at least 1,000 men, with an average of nearly 4,000 men per plant. Establishments employing 500/1,000 men number nearly 2,000 and account for about 13% of the industrial workers. Plants employing more than 1,000 men require, according to modern standards, at least one full-time industrial physician while part-time medical service is generally recommended for smaller establishments. According to these data, several thousand industrial physicians are needed to provide the medical supervision of industrial workers in the United States, as required by modern standards of good practice. This is not to say that there is an immediate demand for such numbers. On the contrary, the present group of industrial physicians recently reported by the Council on Industrial Health of the American Medical Association, numbers only 1,200. Not more than 15 percent of the workers in American factories are provided with full-time medical service

health departments, 2 labor departments, and 7 municipal departments of health. Important contributions to the field, particularly of a research nature, have been made by the U. S. Bureau of Mines, various universities and other research institutions.

Once again the country faces a crisis and great demands are being placed upon industry anew for the rapid production of munitions and other defense equipment. The need for maintaining the health and efficiency of industrial workers at the highest possible level is recognized as an important part of the defense program. Thus the field of industrial hygiene faces a second period of expansion which will require in the immediate future the services of a considerable number of additional personnel. Some of the new work will be temporary and



Dust particles magnified 400 times. The industrial hygienist keeps the plant atmosphere free from dust which produces serious lung damage when inspired.

and only one-third have any medical service at all, according to a recent report of the U. S. Public Health Service. Among the workers in the small plants, employing less than 100 men, medical service is practically non-existent. It is clear, therefore, that considerable educational work must be done among industrial managers in order to build up an adequate industrial health service in the United States while, at the same time, means must be found to bring this service to the small plants at a reasonable cost. Over 98 percent of the industrial plants in the country employ less than 500 men and the development of a practical health service for this group offers a real challenge to the public health worker.

Specialization in industrial medicine is accepted on an equal footing with other special branches of medicine and offers advantages, both professionally and financially, to the young physician. Of no little importance is the opportunity for embarking upon a career in a relatively new and expanding field. Advancement, as in any other work, depends upon the abilities and training of the man. A prominent industrial physician, Medical Director of one of the largest industrial organizations in the country, in answer to an inquiry from a young colleague concerning the opportunity for promotion replied that he could have his job if he fought hard enough for it!

In contrast to the medical specialists, engineers and chemists are not so generally employed directly in the industrial health department. A number of industries with extensive occupational hazards find it necessary to maintain full-time industrial hygiene laboratories for the purpose of studying their processes and developing effective control measures. In a few instances, manufacturers have established laboratories for research into the toxicology of their products or of the raw materials from which they are made, and in one corporation a staff of twenty-five or more physicians, physiologists and chemists are thus engaged. More generally, however, the non-medical industrial hygiene service is provided by the chemical and engineering departments of the industry or by outside agencies such as the State Division of Industrial Hygiene, the insurance carrier, or, to some extent, by the manufacturer of ventilating and other protective equipment.

Undoubtedly, as the health service in industry becomes more highly organized, the opportunities for non-medical industrial hygienists within the health departments will increase, while engineers with special training in safety engineering as well as industrial hygiene will find attractive positions in the smaller establishments in which the health problems, from the standpoint of plant hygiene, are so limited as to require only part-time service.

Since the position of the engineering and chemical specialists in the industrial hygiene field at the present time is not as well defined as that of the physician, one cannot estimate the future requirements with as much certainty. The opportunities, however, are no less real and offer the same advantages as those in any new and growing field. It is of interest to note that during the past ten years the demand for engineers and chemists with special training in industrial hygiene has been greater than for medical specialists.

Educational Requirements

In industrial hygiene, the principles of medicine, chemistry and engineering are applied to the solution of the special health problems of industry. The specialist must, therefore, have basic training in one of these fundamental fields. In addition, an intimate knowledge is required of the occupational poisons and of the manufacturing processes that give rise to them. Special techniques are required to measure the exposure to toxic materials in industry and to determine the extent of injury among the workers resulting therefrom. The methods employed for the control of occupational hazards are also special and fall outside the general knowledge and experience of the engineer, chemist, or physician. These must become the intimate tools of the specialist who needs, further, an understanding of the relation between the health and efficiency of the workers and general environmental conditions such as ventilation, illumination, noise, monotony of work, or other factors that contribute to fatigue and general illness. Psychology plays an important part in determining fatigue and efficiency, and even the health of workers. An understanding of psychological principles as they are applied to industry is therefore needed.

The industrial hygienist must possess an understanding of the organization of industry and of the financial and administrative problems of management and of management-employee relations. Familiarity with labor legislation, state regulations and the provisions of workmen's compensation laws is, of course, essential.

Finally, knowledge of the principles and practice of public health is required since, among the major objectives of the industrial health program are the reduction of lost time due to general illness and the prevention, so far as possible, of the degenerative diseases which occur among older workers.

These objectives are held in common with the community health department and, indeed, the entire program in industry may be regarded as an important part of the health service of the community as a whole.

It is clear from the foregoing that the special knowledge and training required of the industrial hygienist extend beyond the limitations of the basic courses in engineering, chemistry and medicine. In the past, the additional training was obtained through practical experience in industry. The need for post-graduate training is recognized today, however, and universities now offer to graduates in medicine, engineering and chemistry the necessary course of study, usually in conjunction with other graduate courses in public health. The program includes basic courses in public health followed by intensive training in the special field. Consideration is given to the nature of the industrial environment and its effect upon workers' health; methods of investigation and control of health hazards are studied in detail. The organization and administration of the industrial health department, psychological problems in industry and their solution, problems of management and labor relations, labor legislation and the administration of workmen's compensation acts, are some of the other subjects included in the program.

The graduate course, of one year's duration, leads to the Master's degree and fits the student for employment in industry, in government service and in the many organizations that have been developed to serve industry in its health program. Professional training in this field now takes its place with other special branches of advanced study in medicine, engineering and chemistry, and offers to the young graduate in one of these fields opportunities for advancement and service to the community which may be recommended for his serious consideration.

INDUSTRIAL MEDICINE AS A SPECIALTY†

G. H. GEHRMANN

*Medical Director
E. I. duPont de Nemours & Company*

DURING the past twenty-five years the introduction of medical control methods into industry has experienced a more or less stormy course of events. Industry on one side has been rather reluctant to assume its responsibilities for the protection of its employees' health, and the medical profession in general has underestimated the potential possibilities for the development of a new field in preventive medicine, and has been more or less critical of those working with industry to promote the cause. Probably there has been a lack of understanding on the part of all concerned, which, if clarified, may lead to a more cooperative working basis between industry, the medical profession and the industrial medical group.

Any attempt to clarify a situation should be preceded with at least a brief statement of the problem at hand, and in this instance it seems that the starting point might well be a statement of the actual needs of industry. Which is the more important requisite? Is it primarily surgical, or medical? If medical, is it curative or preventive?

In viewing the problem from a surgical standpoint, one must first sketch a rather brief review of the events as they have occurred from the period when industry first began its medical protective program. This time coincides with the introduction of the compensation laws in 1911. These laws made the employer financially responsible for injuries occurring while at work, established fees for the payment of hospital and surgical care, and provided pay for the injured employee. In addition they fixed payments for disabilities and death. This

stimulated industry to establish two new services—first aid and safety.

In the early days the demand for surgical treatment was indeed urgent, both for first aid to the more severe injuries and for adequate treatment for minor injuries, such as abrasions, lacerations, contusions and burns. In the treatment of these minor injuries, industry recognized a means of preventing the more serious sequelae which so often follow.

The more severe injuries, requiring extensive home or hospital treatment, were then occurring with great frequency. However, with the development and application of safety measures, there came about a gradual decline in the frequency and severity of accidents. In our own Company, for example, 30 years ago it was not unusual to have 3,000 major injuries over a one-year period. During the year 1939 there occurred a total of 112 major injuries among an average of 45,000 employees, spread out among units over the entire country. In many of these units there was not a single accident which was severe enough for a man to lose any time or to result in any partial or permanent disability. I quote these figures in an attempt to make clear the great reduction in need for surgical attention. Obviously, although this need is important, it is not nearly as important as many might be inclined to believe.

If surgery, then, is not the major requisite, how important is medical service, defining the term medical service as "medical procedures entirely exclusive of surgical?"

Modern industry is largely chemical and it would indeed be difficult to mention any

†Originally presented at the meeting of the American College of Physicians, April 4, 1940, at Cleveland, Ohio. Reprinted with permission of *ANNALS OF INTERNAL MEDICINE*, Vol. 14, No. 4, October, 1940.

present-day process of manufacture which is not, in part at least, chemical. The tremendous increase in the use of chemical compounds has brought about greater chances for exposure to not only larger quantities of chemicals but to an almost countless number of new compounds. Taking into consideration the number of compounds in use today, our factual knowledge of their toxicological action covers only a relatively small number. It is only by unfortunate experiences that we have in the past learned that some of these compounds produce acute and chronic illness or rapid death. Practically all of this knowledge was obtained after all too many individuals had actually become sick or in many instances had died.

Industry's problem is not the treatment of occupational diseases, as after all, if one will be truthful about it, most cases of occupational disease get well without any treatment, when removed from exposure. The real problem is the prevention of occupational diseases by recognition of the very earliest signs and symptoms which indicate that the employee is getting sufficient exposure to produce physiological changes. When he has passed beyond this stage and pathological changes have occurred, medical protective methods have not been adequate. The actual development of an occupational disease is an admission of failure of both medical and engineering protective measures.

The problem, then, is not how to cure men sick of an occupational disease, but rather how to protect them against ever becoming ill of the disease; and the administration of any adequate program to accomplish this end must be more than casual—it must be carefully planned, actively administered and based upon a foundation of factual knowledge.

Obviously, no one can intelligently set up any industrial health protection program that will function adequately, unless he has

an exact understanding of the hazards as they exist and a knowledge of the clinical picture which may develop. Industrial methods of production today are often very complex, involving not only the use of numerous chemical compounds but also the handling of these compounds under variable conditions, such as high temperatures and high pressures. The general industrial trend today is to so construct processing equipment as to make the entire operation as nearly closed as possible. With a completely closed process, in which dusts, fumes and personal contacts are reduced to a minimum, there remains always the possibility of leaks and the ever-occurring breakdown which is certain to be followed by exposures which are higher than normal. This is shown by experience. No matter how safely any manufacturing process may be when installed, the medical supervision must still be carefully maintained.

Lack of time and space makes it impossible to discuss the intricate details of the investigations which are a necessary prerequisite in any industry to the setting up of a medical protective program. In brief, these should include a careful study of the toxicity of the compounds in use, of the actual and potential exposures, and of the character of the clinical symptoms which will indicate early absorption.

The importance of this first step cannot be overstressed. It is indeed distressing to observe the number of industrial units which are in operation today in which the doctor in charge has very little conception of the working conditions within his plant, no knowledge of the toxicity of the compounds in use, and in too many instances has never been through the factory. This type of so-called industrial medicine is usually conducted by the part-time physician who does not seem to fully appreciate his responsibilities. Such a service is unfortunately stimulating in his factory group a false sense of

security. The plant manager knows little of his industrial hazards and feels that once he has taken on a physician to manage the medical program, his hazards are then well under medical control. I recently made an inspection of a plant in which there was a hazard due to exposure to a volatile solvent. The plant physician, a very reputable man in his community, had been doing the medical work for several years. He had never gone through and studied the plant. He examined all employees before they entered the plant at the time of employment but never repeated his examination after that. He stated very positively that there had been no cases of occupational poisoning in his plant.

The solvent employed in the above instance is toxic, producing both acute and chronic symptoms with severe mental changes. The exposure in this particular plant is sufficiently high to produce numerous cases of chronic illness which can be easily recognized by simple examination methods.

Medical supervision of this type is to be severely criticized. It all too frequently leads to unfortunate misunderstandings with the employee's family physician. The family physician may not be too familiar with his patient's plant exposure, but he does know that there is undoubtedly an association between the man's work and his illness; the plant physician, on the other hand, claims the illness did not occur at the plant.

With an intelligent understanding of existing hazards plus some knowledge of the physical and mental requirements of all jobs in the plant, applicants can be intelligently selected who will fill these jobs with the least possibility of physical damage to themselves. This selection must be made at the time of the employment examination and in this part of the work lies great opportunity for one to develop his diagnostic ability.

In the past, much just criticism has been directed against physical examination of

applicants for employment, because these examinations were made simply for the purpose of excluding individuals who showed even the most minor physical defects. *Such a program is unfair and if continued will create an insurmountable problem of unemployment.* Anyone who has had experience in doing this work knows that it is impossible to find enough physically perfect men to fill any plant of appreciable size, and physical defects are not often a bar to selected employment.

The employment examination must, if it is to be sufficiently accurate to enable one to properly place applicants, include a chest roentgen-ray, complete urinalysis, a serological test for syphilis, a blood count, and a reasonably accurate estimation of visual acuity for both near and far vision.

It is not my purpose to go into the details of how to make a physical examination but rather to point out that one is of necessity almost forced to use most of the available clinical methods because of the difference between examining a sick patient and an applicant for employment. Applicants for employment are in general not inclined to give a truthful medical history concerning either their present or past complaints. Their purpose is to convince the examiner that they are physically fit for the job, rather than come to him for treatment of their ills. So they will deny many pertinent facts. This unfortunate condition was largely brought about by the early physical examinations and the indiscriminate rejections. One of our problems now is to educate the applicant to the realization that for his own protection and future health there are certain types of work to which he is not suited. For example, applicants with arrested pulmonary tuberculosis should never be employed in positions where they will be exposed to gases and dusts which are known to be pulmonary irritants. Individuals with any circulatory disturbance must be excluded from exposure

to certain chemical compounds which we know act directly upon the circulation, and so on, taking into consideration every organ of the body and the possible chances of aggravating any existing disease.

We sometimes find it necessary to reject an applicant for the position for which he has been selected. He then will consult with his family physician who tells him there is no reason why he should not have been accepted. Undoubtedly his family physician is sincere in making this statement, but unfortunately he has not the proper conception of the risk involved and fails to realize that what was done was for the protection of the future health of his patient. The physician outside of industry finds it hard to understand why we cannot accept cases, which we know are risks, for a trial period in order to observe what happens. Here it must be pointed out that any unfavorable developments in any case of chronic or arrested disease are compensable, as the aggravation of an existing condition. Therefore it becomes readily understandable that in addition to the risk to the employee, there is the added risk of compensation expenses to the employer. These risks are often very high as shown by our experience in aggravated tuberculosis, for example, in which our costs average \$12,000 a case.

Under conditions such as have just been mentioned there exists an opportunity for better understanding between the industrial physician and the general practitioner if each will contact the other and discuss the hazards involved in their respective factories and communities. The problems of the chemical industry are too many and too varied for those who are not directly connected with industry to entirely understand. The internist is not expected to render either service or advice, without consultation, to those patients whose ailments fall within the field of the specialist who has studied and

been trained in roentgenology, or neurology, or surgery or other specialties.

In any well organized industrial medical service, every employee who is examined, whether it be for employment or periodic checks, is advised to consult with his family physician for the treatment of physical defects or illness found at that time which are not of occupational origin. Industry, in general, is not interested in treating those cases for which they are not responsible and as a matter of fact, is only interested in guiding these cases into the proper medical hands in order that they may improve their general health and thereby become more efficient and safer workers. The number of cases referred to the general profession by the industrial physician is truly great. For example, we examined 4,200 individuals in our central office during 1939 and over 2,000 of these people were advised to consult with their physician for the correction of existing physical defects or illness. To one who is not experienced in examining a group of so-called well people, these figures might tend to indicate an abnormally high percentage of defects. However, it is indeed amazing when one examines any group of people to find how few, regardless of occupation, do not have some defects that require either surgical, medical or dental attention.

A few figures from the above group will give some ideas as to this: 112 had organic heart disease with audible murmurs; a total of 865 showed evidence of circulatory disease.

Thus, in addition to the duties involved in the administration of an adequate medical program for the prevention of occupational diseases, we have the added problem of persuading large numbers of people to improve and protect themselves, insofar as medical aid will accomplish this objective, against acute and chronic diseases while in the early stages, before they have become disabled. My purpose in mentioning these cases is to point out to those of the medical profession

who persist in maintaining that the industrial physician is robbing them of work which rightfully belongs to them, that they are really having referred to them many cases which would otherwise not be seen until much farther advanced.

We have another group consisting of 1,250 syphilitics, all of whom are gainfully employed; every one is under the care of his or her family physician for adequate treatment. Each one must frequently present satisfactory evidence to show that he or she is getting adequate treatment regularly.

Knowledge of the action of the compounds handled, the symptoms to be expected and the careful selection of applicants who can work under these known conditions safely must always be followed up by periodic physical examination. In this examination lies the most important part of the work, as almost the entire program of prevention is dependent upon these repeated examinations provided they are done with the proper frequency and are of such a nature as to reveal early signs of absorption.

The frequency of the periodic examinations depends upon the rapidity with which the compounds in question may be absorbed and produce symptoms. The type of examination must be such as to reveal the earliest symptoms of absorption, not the symptoms of acute illness. This phase of industrial medicine may truthfully be said to require

one with special knowledge and training to organize and execute the program.

In addition to understanding the mode of action and the clinical picture that indicates early absorption, it is important to realize that any examination program must be as practical and as simple as possible. When dealing with a sick patient in the hospital the physician orders blood counts, blood chemistries, roentgen-rays and many other procedures as often as necessary, and the patient submits with more or less complacency. If, however, one attempts to handle a group of workers and asks them to submit to more or less painful procedures too frequently, they will sooner or later rebel. Furthermore, in industry one must always remember that any medical examination must be made on company time and time away from work means loss of money to the employer and increased costs of production. Medical costs are eventually charged against production and an increased cost of even so small an amount as one-tenth of a cent a unit may mean added costs of thousands of dollars over a period of one year. I mention costs because it is quite obvious that medical men, in general, fail to realize the importance of the economic problem. There is in general the feeling that industry should pay regardless of the costs because they need the service. Industry does need the service and will pay willingly if and when it can be convinced of the need for the service, that it will be the answer to the problem at hand, and will lead to savings in compensation costs and potential medico-legal suits.

The results of the periodic examination determine whether the employee shall continue with his work or whether he should be removed from exposure and placed, temporarily at least, on other work. If he shows signs of early absorption, then the industrial physician must determine whether the faulty exposure is due to general working conditions or careless methods on the part of

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Engineer



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the worker himself. The latter is often the cause and obviously it is of no avail to recommend an entire change of working conditions, which will never suffice under such circumstances. It is sometimes necessary to dismiss workers who are consistently careless and thereby constantly subjecting themselves to unsafe exposures.

The follow-up of medical conditions in the plant requires frequent and often prolonged visits to the actual operations where conditions may be studied first-hand. Air analyses are sometimes valuable but should never be used as a criterion of safety. From the medical standpoint, we are interested in knowing whether the men are being affected rather than what the concentrations in the air might be. Air analyses are of value to the engineering department who use them as a guide to determine whether their ventilating devices are functioning according to expectations. It is unsafe to set any concentration of a compound in the air as a safe one unless medical examinations are to be used as an index of health among the men.

Any program of medical control in industry, if it is to be adequately followed, must necessarily require sufficient time on the part of the physician who undertakes it if he is going to give his best efforts toward the prevention of occupational diseases and the promotion of better health.

If the work is done properly, the examinations made accurately, and the follow-up conscientiously pursued, the opportunity for real, worthwhile, scientific medicine is available. On the other hand, the work can be non-productive of preventive results and scientific interest, and a sheer waste of time, if performed as too much of it is being performed at the present time.

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VOCATIONAL GUIDANCE PROBLEMS OF NEGROES†

AMBROSE CALIVER

*Senior Specialist in the Education of Negroes
U. S. Office of Education*

THE problems of vocational guidance of Negroes in schools and communities of the North are many and varied. Changing



Dr. Caliver

conditions in the occupational world, in population, and in the schools have increased the number and seriousness of these problems to such an extent that they can no longer be ignored with impunity.

Certain changes

in the population are especially significant in the consideration of the topic under discussion, the most important being the general migration of Negroes from the South to the North. This movement¹ had been in progress for many years, but it was given impetus during and immediately succeeding the World War, and continued at an increasing rate until, in 1930, twenty percent of the total Negro population of the nation was living north of the Mason-Dixon Line. Prior to 1900, Negroes migrated less than white persons; but in 1930 the proportion of native-born citizens of the United States who were living outside their states of birth was about 2% higher among Negroes than among white persons.

The northward migration of Negroes has been almost entirely to large urban centers. In 1930, 88% of the Negro population of the North lived in cities. The situation in the South presents a striking contrast to this;

only 32% of all southern Negroes live in cities. The percentage of southern Negroes who are found in cities has been rising, but the proportion of the southern white population living in cities has been increasing still more rapidly, so that the proportion of Negroes in the population of most southern cities has been decreasing.

In 1930 there were 220,000 Negroes in Philadelphia, 152,000 or 69% of whom were born in other states. More than two-thirds were born in southern states. There were as many Negroes in Philadelphia from the state of South Carolina as were in the city of Charleston. Negroes in New York City who were born in Virginia numbered 44,471. The Negro population of Richmond and Norfolk, the two largest cities of Virginia, numbered respectively 52,988 and 43,942. Negroes in Chicago who were born in Mississippi numbered 38,356 which figure is twice the number of Negroes in Jackson, Mississippi. A majority of the Negroes born outside the state of their residence were born in the South. These facts suggest certain problems, in addition to those peculiar to the North, that should be attacked, and particularly emphasize the national character of the educational and guidance problems.

The problems of providing proper vocational guidance for Negroes in northern communities seem to fall into three groups, (1) those concerned with understanding the conditions and needs of Negroes, (2) those relating to the application of the major steps of guidance to the problems of Negroes, and (3) those involved in utilizing available opportunities to apply the principles of democracy in the guidance of Negroes. It is

†Condensed from an address presented by Dr. Caliver before the Philadelphia Vocational Guidance Association, January 21, 1941.
¹The problems of a changing population; National Resources Committee, May, 1938, p. 99. U. S. Government Printing Office, Washington, D. C.

assumed that the principles of vocational guidance are the same for Negroes as for others, but that their application may be different under different circumstances, and that special emphases and adjustments should be made on the basis of needs of individuals or groups of individuals; and that the conditions calling for special consideration are not inherent in the Negroes' racial characteristics, but rather result from their social and economic backgrounds and present status.

Understanding Conditions and Needs of Negroes

Social and economic backgrounds

Among the social and economic background factors calling for special study are poor homes and disorganized family life; poor health and high mortality rates; lack of recreational facilities and opportunities; low economic income; lack of persistence and systematic work habits; and faulty sense of values. These characteristics are also prevalent among poor whites of the South, but because of the conditions under which Negroes have lived the characteristics mentioned are accentuated among them.

Intellectual background

The factors influencing Negroes' intellectual background, to which attention should be given by all guidance workers in the North, are the poor conditions of the schools for Negroes in many of the communities of the 17 southern states maintaining separate schools for the two races, the main characteristics of which are inaccessibility, inadequate buildings and equipment, short terms, over-crowding, and poorly prepared and poorly paid teachers. With respect to vocational education and guidance in the separate Negro schools there is a considerable lack in the number of schools offering and in facilities for voca-

tional instruction, in the number of courses adapted to modern occupational demands, in the number of students enrolled in many courses now offered, in the number and quality of preparation of vocational teachers, and in financial support. Guidance programs are inadequate in number and quality. Where guidance is attempted, improvement is needed in its organization and administration, in information obtained about students and occupations, in use of the information obtained, and in guidance services.

The generally poor social and educational conditions which have been mentioned, and which have characterized the life of Negroes for generations, have resulted in their making a poor showing on intelligence and achievement tests in comparison with the white group. The thesis that this poor showing of Negroes is due to their biological inferiority is increasingly considered to be invalid. A majority of the leading psychologists and anthropologists agree that intellectual differences found among races are probably due to differences in experience and environmental factors, in racial ideals, and in social status.

For example, it has been shown that regional contrasts among people of the same race are greater in some cases than contrasts between different races living in the same environment. It is well known that the median rating on the Army intelligence tests of Negroes from some northern states was as high as, or higher than, the median rating of whites from some of the Gulf states; and a high correlation has been found between intelligence ratings and length of residence of Negroes in some northern cities. These results may possibly in some cases be influenced by selective migration, but in the main must be attributed to the influence of variations in environment on intelligence test performance. It is obvious that there is great overlapping in individual abilities among all racial groups, many individuals in

groups that are now retarded being intellectually superior to many individuals in more advanced groups.

The evolution of the above conclusions is indicated by the conclusions of Thomas R. Garth resulting from four of his studies at different times and reported in the July, 1939 issue of the *JOURNAL OF NEGRO EDUCATION*². The conclusions at different dates are given below:

1. "These studies altogether seem to indicate the mental superiority of the white race. . . . Altogether it may be said that the investigators recognize that these experimental results are crude and so they must be taken tentatively." (1925)

2. "It would appear that it (the racial differences hypothesis) is no nearer being established than it was five years ago. In fact, many psychologists seem practically ready for another, the hypothesis of racial equality. But the problem in either case is the same as it was—to obtain fair samplings of the races in question, to control the factor of nurture, and to secure a testing device and technique fair to the races compared." (1930)

3. "Much of the difference found in the results of studies of racial differences in mental traits is due to differences in nurtural factors and the rest is due to racial mobility, so that one race has a temporary advantage over another." (1934)

4. ". . . any differences so far found in these traits must of necessity be laid at the door of differences in experiences and the environmental factors, in racial ideals, and in social status. In fact, any difference so far found may be said to be due to one of two factors, the factor of selection or the factor of nurture." (1937)

The facts and conclusions presented above have important implications for the education and guidance of Negroes, and are particularly significant for teachers and

counselors who have little knowledge of, and who may have certain preconceived ideas concerning the potentialities of Negroes. In connection with this thought, Martin D. Jenkins³ lists the following conclusions after a survey of the literature on racial differences in mental ability.

1. Effective functioning of the individual is greatly enhanced when environmental conditions are optimum.

2. Negroes of very superior intelligence emerge when environmental conditions are propitious.

3. Any program looking toward the development of the American Negro must be based on the assumption that the race is fully capable, from the standpoint of mental ability, of assuming a position of equality in the social order.

Lack of homogeneity

Another factor to remember in attempting to guide Negroes is that they are not homogenous. In fact, the American Negroes are among the most heterogenous population groups—in physical appearance, in social and economic status, in educational background, and in intelligence. When teachers and counselors who have stereotypes about Negroes rid themselves of these stereotypes and realize that there are as many differences in abilities, interests and ideals among Negroes as among other racial groups, guidance will be based on sound democratic principles as it should be, and Negroes will be guided into a variety of occupations rather than into only a few.

In reference to the above implications, the National Resources Committee makes the following observations in its recent publication on *Trends in a Changing Population*:

"The quality of individual living, as well as the successful operation of the national economy, depends in large measure on a proper occupational distribution

²Martin D. Jenkins, *Mental Ability of the American Negro*, *JOURNAL OF NEGRO EDUCATION*; July 1939, pp. 511-20.

³Ibid.

of the people. For those who earn their livelihood by work of hand or head the job is an important consideration. It is one's daily tasks that give life its tone and color; for the worker and for his family many of the satisfactions of life grow out of the attractiveness of his occupation. Furthermore, the orderly operation of the economic system requires, among other factors, a balanced distribution of workers in the various occupational groups. It is enormously important, both from the individual and the social point of view, that the right persons with the proper training be appropriately distributed among the various occupations. Herein lies one of the major social obligations of the American educational system.

"Any well-planned program that looks toward a more adequate adjustment of the population to occupational opportunity must be based on careful and detailed analysis of occupational trends and of the changing demands that the various occupations are making upon the skill, the intelligence, and the social qualities of the worker."

Application of Guidance

There are special types of problems with which a counselor is faced in attempting to lead Negroes through the four major steps of guidance. Some of these problems are brought about by Negroes themselves; others come from prejudice and misunderstanding on the part of the majority group; while still others result from general social and educational conditions. The differences in the nature of these problems call for different solutions. None, however, present insurmountable difficulties, provided we cease being complacent about them and attack them with intelligence, purpose and courage.

Selecting a vocation

Three major problems relate to selection of vocations. The first, faulty attitudes toward occupations on the part of youths and adults. There is a lack of appreciation of the fact that all types of work are honorable and have their place in the scheme of things. The attitude of Americans in general, and the conditions under which Negroes have lived cause many of them to erect a "hierarchy" of occupations, and place a halo around white-collar jobs. Moreover, certain forces in the American social order have tended to restrict Negroes to a limited number of occupations, so that Negro youths do not have the incentive that comes from seeing their fellows following a variety of callings. Even when Negroes have broken through the barriers and find work in unusual situations there has been no adequate guidance machinery by which the information could be widely disseminated. These conditions have limited the range of vocational interests among Negroes and caused their choices to be concentrated in the professional fields.

The second problem which has become increasingly acute during recent years is that of warped personalities growing out of the relief situation. The problem exists among all youth, but because of the excessive proportion of Negroes on relief the problem is accentuated among them. So many of the adult members of their families are without a definite occupation that they are deprived of the feeling of security, the ambition and hope that usually result from steady work. Moreover, they see so many of their fellows who have recently finished school without work that many of them have developed a defeatist attitude, which profoundly affects their choice of a vocation.

A third problem has to do with the attitude of certain teachers and counselors, who do not know that Negroes are employed,

even though in small numbers, in practically every line of work, and who make no effort to explore opportunities and possibilities for their employment. As a result of this lack of knowledge plus the belief that Negroes are limited in their capacity and in their ability to perform certain tasks, some teachers and counselors do not encourage Negroes to make their vocational choices on the basis of their interests, and from a wide field of possibilities. Without advocating that we train people promiscuously regardless of employment possibilities, it is suggested that the vicious circle surrounding the training and employment of Negroes be broken. The educator says that "there is no need to train Negroes because they can't get employment;" and the employer says "I don't employ Negroes because they are not trained." This circle must be broken somewhere, and it is the business of guidance workers to show that the place to begin is with the training. It is better to be trained and not be called for service than to be called and not trained. The training an individual receives is never lost—he can use it in various ways, and he is always a better citizen because of it.

Preparation for a vocation

There are several problems which many Negroes face in the North in their efforts to prepare for a vocation. Only two will be discussed here.

The first is a lack of occupational background. This is especially true of those whose early training was in schools that lacked the proper facilities and instruction to provide general occupational knowledge and skill preliminary to specific vocational preparation. Part of this same problem are the deficiencies in reading ability resulting from short terms, faulty methods, lack of facilities and poorly prepared teachers.

The second problem has to do with a lack of apprenticeship opportunities. It is diffi-

cult to find employers who are willing to take Negro apprentices. Sometimes when the employers may be favorably disposed, policies of certain labor unions set up barriers. In general the apprenticeship programs are under the control of labor unions, and the difficulties which Negroes encounter in their relations to unions are too well-known to discuss here. A solution to the problems involved will probably have to be approached differently in different communities. The important thing is to get people thinking about it with a sympathetic understanding and democratic approach.

Finding employment

One of the major problems which Negroes face in seeking and finding employment is a lack of responsible, coordinated employment agencies that have a social vision and that are administered fairly and without prejudice. Because of the circumstances in which Negroes find themselves, employment agencies interested in placing them should not simply wait for requests from employers, but should take the initiative in seeking openings and making contacts with employers in order to sell them the idea of giving Negroes an opportunity. If the employment agency cannot do this then it should be done by some other volunteer agency.

A second problem is a part of the first, and involves breaking down prejudices against Negroes where they exist among employers and employees. Persons who have followed up Negroes at their work know, contrary to common belief, that they are capable of doing skilled work; that they can and do work with white workers without friction; that they are as efficient, industrious and dependable as others; that they will cooperate with other workers in maintaining a fair standard of wages and hours and good working conditions; and that labor turnover

(Continued on page 67)

THE BUCKNELL GUIDANCE WORKSHOP

FRANK G. DAVIS

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Bucknell University*

THE term "workshop" has become a familiar one in educational circles the past few years. The pioneering work done by the Progressive Education Association, with the assistance of the General Education Board, has broken ground and cleared away a good deal of underbrush for projects to be carried on by many unsubsidized institutions. Bucknell University is one of such institutions.

In general, the workshops are planned to attack the whole problem of education. In some instances, as at the Pennsylvania Workshop, this is confined to the program for the non-college pupil. The Bucknell Workshops, on the other hand, are planned for three specific phases of education: guidance, technique of teaching, and stage design and stagecraft. The second and third are set up for two types of workers—teachers in service who desire help in solving discovered teaching problems, and teachers or professional or amateur theatre workers who want to know how to design and execute complete stage sets, including scenery, lighting, sound effects, etc., for dramatic performances. The following discussion deals with number one, the Guidance Workshop.

Two questions arise. First, what is guidance, and second, what is a workshop? The first has been asked and answered many times and many persons enrolled in the workshop come with different definitions. Certainly some of them leave without radical change in their views. The general attitude taken by the workshop staff is that guidance cannot be divorced from education. In other words, guidance is inextricably involved in any intelligent program of education whether the school involved

claims to have a guidance program or not. An intelligent program of individualized education is the accepted objective. If one wishes a definition he may be willing to accept the following: "Guidance, or personnel service, consists in giving *intelligent* attention to pupils according to their individual needs." The author prefers the term *personnel service* because of its comprehensiveness, since it covers the entire scientific approach to individualized education.

The question "What is a workshop?" will probably raise fewer disputes in its definition. Although some enrollees in workshops have insisted that it was merely an opportunity for leisurely discussion of problems and that anything other than discussion has no place in a workshop, we believe that most persons will agree that it is an organization set up for the solution of pressing educational problems, regardless of the amount or kind of work involved. It is expected that many questions can be answered in small and large group discussions or in individual conferences with advisers, but others will require work in the library or laboratory or excursion or other situation.

The Bucknell Guidance Workshop is built on the assumption that the term is just another name for a scientific approach to the solution of a problem. It is assumed, then, that in its solution the seeker-after-knowledge will bring as grist to his mill every possible aid. One definite aid is the Demonstration School with its more than five hundred pupils, its corps of trained supervisors and its group of teachers in training. To this school many workshopers take their problems for observation, practice or experimentation.

The range of problems that may be taken

to this laboratory is wide. A listing of a few from the 1940 program is suggestive. One person was concerned about a home-room program that would really work. He obtained permission from the director of the Demonstration School to plan and supervise a series of programs to be carried out with the assistance of the training teachers and student teachers. Another wanted experience in the making of real case studies under the critical eye of an expert. These were made on actual pupils in a normal school situation. A third student wanted experience in individual counseling under supervision, and a fourth in group counseling. Selection and administration of a testing program was another student's main concern.

To be sure, the Demonstration School is not the only laboratory source of information. A superb job was done by one student in job analysis of the entire organization of a busy factory. One man, an assistant principal of a large high school, brought from the school's files a mass of material on teachers and pupils which was used, along with much more information, in planning an improvement in the current personnel set-up. A supervising principal brought facts from his school system on which, with help of staff and other workshop members, he was able to plan a comprehensive program for all grades, which already shows promise of success. A young woman who had an idea that the classroom teacher could do a pretty good guidance job herself gathered materials and built an interesting plan which appears to be working well. A high school teacher assigned to plan a leadership training program for elected student officers brought in her problem and, with the help of faculty and colleagues, was able to go home with a plan complete enough for experimentation. A director of community activities found here help and inspiration for the evaluation and re-planning of a comprehensive program. Many other projects were planned by

the remainder of the thirty enthusiastic workshopppers, each one using every available source of inspiration and help.

The three libraries were constantly used by registrants. In a room adjoining the main conference room was housed a large amount of material specifically related to guidance. Books, pamphlets, government reports, guidance programs, record forms and tests formed the bulk of this material. A librarian was in charge, one of whose duties was to see that exhibits of guidance materials, regularly changed, were spread out constantly in the lobby. Within one hundred feet was the main college library, and in easy reach the curriculum library, available at all hours of the day.

The workshop day began at eight o'clock in the morning and closed at four in the afternoon with a two-hour recess at noon. Individual and small group conferences were held until ten o'clock with students desiring them, and at ten the general conference led by a staff specialist was attended by most of the students, although attendance was not compulsory. These conferences were led by experts in various phases of personnel work who were brought to the campus for one week each. Each specialist spent five full days in the workshop and was available for consultation in the evenings. In addition, three regular members of the staff were on hand daily, one of these full time and the others two hours each.

The physical arrangements for the workshop were well-nigh ideal. A large lobby, thirty by sixty feet, elaborately equipped for comfort, opened directly into six smaller rooms on three of its sides. One of these housed the guidance library, another served as office and consultation room, while the remaining ones were used for group and individual conferences. While the workshop was such in fact as well as name, these appointments added much to the informality and "relaxing-ness" of the entire set-up.



General Conference in the Guidance Workshop

Not everyone who applied was admitted to the workshop. In some cases, it was believed that a student would profit more from class attendance until problems became more definite in his mind. Students were admitted after filling out a lengthy application blank giving considerable personnel information and in most cases naming the specific problem or problems to be attacked. In a few cases a student was unable to locate his problem specifically until he met his adviser for consultation. Wherever possible, the adviser had this personnel information before the opening of summer school in order that some principles of personnel service might be applied from the beginning with registrants. At registration time a snapshot photograph of each applicant was taken and attached to his application so that his adviser might the more easily identify him in the early days and the

college might have a more vivid record after the summer school experience.

A word should be said about the social side of the program. Daily the workshopers, staff and students, lunched together. Daily they listened to a speaker whose top time limit was fifteen minutes. These talks were made by staff members, visitors, and many notables brought to the campus for various purposes. Five of them were given by experts on Latin American affairs. Two or three luncheon periods were given over to gaiety and social activities. Committees planned and carried out picnics and excursions to places and institutions of professional interest. Numerous tennis courts and playing fields, as well as the campus golf course, attracted some students. Many attended the weekly plays put on by the Eagles Mere Players assisted by the Stagecraft Workshop. All who stayed on the

campus heard the weekly symphony orchestra concert.

What are the controls in such an informal set-up? Don't you find some people who are not really interested and try to get by with a minimum of work? These questions have been asked of many workshop directors and staff members. We believe that all of the registrants came with serious purpose. A few, however, having been trained in a credit-chasing atmosphere, through high school and college, apparently need rather definite guidance if they are to avoid a too informal and ineffective approach. For this minority it is well that some checking program be instituted. Our plan requires at the end of each week a written report on the individual's activities and reading during the week just past and a statement of his plans for the following week. Both students and faculty felt this checkup was valuable.

At the end of the summer the student hands in a report on his summer project or projects indicating three things; objectives, techniques and findings. Students claim

there are two good reasons for this report—first, they find the summarization valuable in their own education and, second, it is frequently well to have something concrete to take back to their schools.

It is not possible to make an objective evaluation of the workshop. However, near the end of the summer some time was given to evaluation. Students were invited to write anonymous statements of their judgment of its effectiveness. Also one or two meetings were held for the purpose of oral criticism. The atmosphere was unconstrained and it is believed that the statements were sincere. One suggestion made by a number of students was that none should enter the workshop until he had located a definite problem. All expressed themselves as pleased with the experience and satisfied that the workshop was ideal for graduate work. The staff members, while agreeing that it did not solve all problems, felt that the workshop was a most stimulating departure from the traditional standardized summer procedures in teacher training.

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A VOCATIONAL GUIDANCE CONFERENCE

EDITH JANE STAUFFER

*Dean and Professor of Education
Moravian College for Women*

THE Vocational Guidance Conference held each year at Moravian College for Women, Bethlehem, has for one of its



Dean Stauffer

purposes the broadening of the views of many of the students who are taking a Liberal Arts course, concerning adaptations of their interests, abilities, and education to the economic world. It also seeks to

serve those students who are preparing for determined careers by making more specific the demands involved in such choices. Instructions for personal development which will help the applicant to sell herself, and definite suggestions for making contacts are emphasized.

Four years ago a number of students who were preparing to be teachers, and who were discouraged by the outlook in regard to placement, came to the Dean to ask for help in seeking other avenues for employment. As a result of these conferences with seniors, a successful employment bureau director from Philadelphia was invited to speak to all the students in a convocation lasting one hour. She dealt with careers other than teaching in which she had placed Liberal Arts graduates and the personal qualifications which contributed to success. The seniors had individual conferences with the speaker through the rest of the day. Through follow-up on their own initiative several of

the students were placed following graduation, as a result of this effort.

The Student Council of the College realized the value of the beginning step in a Vocational Conference, and the next year set aside a definite sum in its budget for a larger effort. The faculty was petitioned to abandon classes for a day. The time set then, and followed since, is an appropriate Friday shortly before the Spring vacation. The faculty, without a dissenting vote, has encouraged the students and the Dean. Members of the faculty also show their interest by helping to suggest speakers, and through attendance at many of the sessions.

The conferences are set up with the appointment, by the President of the Student Council and the Dean, of a special committee for Vocational Guidance Day representative of all classes and all courses. All of the students are polled by this committee as to what specific occupations they would like to have presented. After their suggestions are studied by the committee and the Dean, and preliminary work has been done on securing possible speakers, all of the students are given a list of occupations which could be presented. They are asked to check the conferences they would wish to attend. This report serves as a guide for making up the program, as well as for arranging the time and places for each conference.

The students take charge of managing all of the mechanics for the conference. On two successive days preceding the Conference, registration is held at an appointed place by members of the committee. Each student is given a program and a card on which she registers for three special conferences and



Dean Stauffer and officers of the Student Government discussing Conference plans.

the two general sessions. Through student-government regulation, attendance is required of all students. The registration cards are distributed to each student at the first general session, and must be signed by the student secretary of each conference and turned in at the end of the day. A special class representative checks on the attendance at the general sessions. A student chairman presides at each meeting, and acts as a hostess for the speaker during the visit to the college.

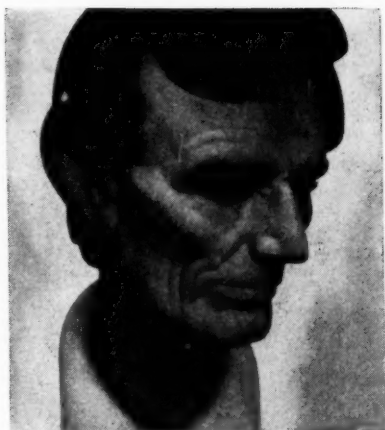
The program for the 1941 Conference began at 8:45 a.m., in a general session, with an inspirational talk on personal qualities which make for success in vocational life, by Mr. William Moorhead Vermilye, Vice-President of the National City Bank of New York. From then until 11:30 a.m. various career conferences were conducted by specialists in their respective fields covering Teaching in the Secondary Schools, Public Health Nursing, Newspaper Work, Insurance, Library Work, Textiles and Clothing in the Home Economics field, Department Store Work, Chemical Research, Social Work, and Home Economics in the commercial field. Miss Helen Martin, of *Town*

and *Country* magazine spoke on Advertising and Mrs. Enid Beaupré of the program division of the National Broadcasting Company presented a session on Radio work. A forty-five minute period was next arranged so that individuals could, through the student chairman-hostesses of the various divisions, arrange personal conferences with the speakers.

After luncheon, in the college dining room, Mr. Lewis J. Howell, President of the Philadelphia Music Teachers Association, conducted a conference on Music; Mrs. Gertrude Marvin Williams, a division publicity chairman for the American Association of University Women, led a group interested in Publicity; Miss Helen Goodell, Research Assistant to Dr. Howard Wolf of the Cornell Medical Center, New York, spoke on the work of a Laboratory Technician and Research Assistant; and other conferences were held on Personnel work, Proof-Reading, Dietetics and Secretarial work.

In each case, the speaker for the individual conference had prepared a talk covering the work and opportunities in the specific field,

(Continued on page 56)



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VOCATIONAL GUIDANCE CONFERENCE AT MORAVIAN COLLEGE FOR WOMEN

(Continued from page 54)

the requirements for entrance, and ways to make contacts. Time for questions from the students was allowed.

Also in the afternoon a general session was held in the college chapel at which two types of interviews were presented. Superintendent William L. Connor of the Allentown (Pa.) Public Schools sent four of his staff to conduct an un-rehearsed interview with a prospective candidate for teaching. Mr. Robert A. Lambert, Personnel Director for the Laros Silk and Textile Company of Bethlehem concluded this hour with a dramatized presentation, partially rehearsed, of two personal interviews with applicants for a business position. One of the students demonstrated all the bad features manifested in employment offices by those who are interviewed, and the other answered the questions directly and with assurance.

Just as space is devoted in the *Belfry*, the student newspaper, to publicizing the Conference for several weeks before it takes

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place, so, during the week following, reports of each session are published by the appointed secretary. One feature of this is the opportunity for the students to make suggestions for improving the mechanics, scope and quality of the program in another year.

The speakers, who so generously give of their time, interest and experience, have remarked that the conference reveals democracy at work as well as the poise, alertness and charm of modern youth. The students testify that they receive help in vocational orientation, and look upon the day as an integral part of their college education.



SPARK PLUG OF *Progress!*

IN A dim-lit laboratory, amid a maze of apparatus and a mass of figures, a lone individual labors on into the night. Time has ceased to exist, for his is a labor of absorbing interest—the development of an idea—a “spark”—which, when perfected through his own initiative, will be given to the world to assist its progress.

That’s the American way . . . progress through the “spark plug” of personal initiative.

So it is with U. G. I. Fifty-nine years ago a group of individuals, with foresight and initiative, and unfettered with restricted horizons, brought U. G. I. into existence. Since then, an almost continuous stream of “ideas” has been born, reared and perfected through unceasing study and research by individuals within the company. . . . And passed on unselfishly for the benefit of millions upon millions of users of gas and electricity.

In the future, as in the past, opportunity for the development of individual initiative must be preserved if progress is to continue.

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An Open Letter ~

During the past year, the first in the history of the Pennsylvania Association of School and College Placement, I have tried to watch carefully for the reaction throughout the country to the stated objectives set up for the Association, so as to be prepared to shape things in a way which would meet with most general approval.

This reaction has been extremely interesting to me, and I have found that institutions from coast to coast are apparently keyed up to a sense of the great importance of exploring the techniques of placement and also the implications of such work.

For example, in one of the larger Universities a complete organization chart has been drawn-up, looking forward to the ultimate tie-in of all activities throughout the University which relate to Student Personnel, Guidance and Counseling, and Placement. A similar trend is noted in many other institutions. I cannot say, of course, the extent of the changes that will occur, or the exact form they will take, but I feel the indication is of a greater interest in placement in all its ramifications than was exhibited in earlier years.

I agree with some critics that if the measure of value of the Pennsylvania Association of School and College Placement is based upon placement itself, then at a time when the demand for graduates is high there might not seem to be a need for such an organization. However, those who were active in the formation of the Association have been inclined to think of it not in its relation to the volume of placements, but rather in relation to the deeper implications which are included in the educational aspects of the work.

This year I have taken special interest in the vocational guidance efforts in High Schools, including the more systematic efforts which are being made to direct students into suitable college courses, and to awaken the interest of both parents and students in career choices as far as they can be determined at the High School level.

We are now in the midst of building up the necessary standing committees to work on the various aspects of the Association's activities. The reaction of business and industry has been most encouraging. They, like the colleges, feel that much good will come from further discussions on ways and means for improving and standardizing the practices of college recruiting.

A close watch has been kept, and will be continued, to prevent overlapping of activities of this Association with those of any other group now functioning. It has never been the intention of the Administrative Committee to duplicate what has previously been done in other channels.

Before the current year is out, a ballot of next year's officers will be sent to all members of the Association. By promptly considering the names thereon, and submitting his vote to the Executive Offices, each member will be voting not only for personnel for the coming year, but for the continuation and the widening of the Association's activities.

Sincerely,

Clarence E. Clewell

President

Note: The above letter is taken from the reply made to queries regarding certain objectives of the Pennsylvania Association of School and College Placement.

UNIVERSITY OF PENNSYLVANIA

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1941

The Work of the University is Divided into the Following Undergraduate and Graduate Departments and Other Divisions:

The College	The Department of Landscape Architecture
The College Collateral Courses	The College of Liberal Arts for Women
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The Towne Scientific School	The School of Medicine
The Moore School of Electrical Engineering	The Law School
The Wharton School of Finance and Commerce	The School of Dentistry
The Post Graduate Division of the Wharton School	The Courses in Oral Hygiene
The Institute of Local and State Government	The School of Veterinary Medicine
The School of Education	The Graduate School of Medicine
The Division of Nursing Education	The Evening School of Accounts and Finance
The Illman-Carter Unit	The Extension Schools
The Division of Vocational Teacher Education	The Department of Physical Education
The Division of Cultural Olympics	The Division of Physical Instruction
The Division of Schoolmen's Week	The Division of Student Health
The School of Fine Arts	The Division of Intercollegiate Athletics
The Department of Music	The Division of Physical Education for Women
	The Division of Student Affairs
	The Reserve Officers Training Corps of Army and Navy
	The Psychological Clinic

Information on the above University Departments and Divisions may be secured from the Secretary's Office, University of Pennsylvania, 3446 Walnut Street, Philadelphia, Pa.

BOOK REVIEWS AND DIGESTS

THE BACKGROUND OF COLLEGE TEACHING, Luella Cole, Farrar and Rinehart, New York, 1940. xv & 594 pp., \$3.50.

"I have . . . tried to gather together what is actually known about college life, college students, and college instruction in such a way as to help the prospective teacher acquire the information he will need when he enters his profession." "It is emphatically not my intention to draw anyone's conclusions for him or to tell him how to apply the facts to his own work." "This book . . . merely presents facts in a condensed and synthesized form and leaves the interpretation and application of them to the discretion of the reader." So read the objectives as found in the foreword of "The Background of College Teaching" by Luella Cole.

These objectives have been achieved but the first might well have included the teacher in service as well. While these facts have been gathered to help the "prospective" teacher, the book is one which should be of great help to the experienced college teacher, also. Particularly should it aid the teacher of long experience who needs to make an effort to bring himself up to date on current issues in higher education. The careful documentation throughout furnishes a valuable bibliography and the factual information supplied gives the reader confidence in the presentation. The many concrete illustrations give clarity to the discussions and actual case studies give reality that is refreshing. In spite of the fact that the author constantly minimizes the importance of her personal opinions, she indulges in such opinions freely and is so logical in them that they become a valuable contribution. Practical common sense abounds and causes the reader to feel that the author has actually experienced a great number of the situations described. She must have had exten-

sive contacts with students and faculties to make the writing of this book possible. Five main divisions compose the volume: the Present-day Scene; the College Student; the Problems of Classwork; the Social and Economic Aspects; and the Measurement of Teaching. These parts are not of equal value. Neither are the chapters within the five parts of equal value, due to the fact that data relative to the various topics discussed are in some cases very slight while in others there is an over-abundance. The chapter headings and sub-headings are so arranged that one can readily find discussions of particular topics.

Dr. Cole has placed emphasis on the work of colleges or universities with enrollments of 2000 or more since "less than 20 percent of teachers and students are to be found in really small schools." In spite of this the small college has not been neglected and the advocate of the small college will find numerous references to the advantages of such institutions. Attention to the large colleges has not meant discrimination against the small ones.

In Part I, three chapters should be especially helpful to the prospective teacher. These are: Modern Objectives; the Curriculum; and Personnel Work. Objectives continuously occupy the attention of teachers and many become disgusted with the endless discussions about them. Yet without defined objectives, the college and the teacher must drift hopelessly along. If we grant Dr. Cole's position, we shall "accept people as they are and give them the type of education from which they can most profit." She says, also, "It seems to me more profitable to adjust the objective to the student than to develop a fanatic belief in any one aim." Her discussion of objectives from this viewpoint is worth reading, whether you agree or disagree with it.

The chapter on curriculum will give the

prospective teacher much routine information that he should have before entering the college. It is a matter of never-ending concern to a college faculty.

In the chapter on personnel work the author is probably at her best in Part I, but this discussion is closely related to the chapters in Part II: the College Student. In fact, it appeared to me that it might well have been placed in Part II, which is probably the most valuable part of the book for the inexperienced teacher. If the teacher knows his subject, the student becomes the focus of his attention. He must be met in class and out of class and the capable teacher must know what to do for him and with him. It is quite evident that Dr. Cole has dealt with students directly. She speaks with an assurance that carries conviction, in spite of the fact that she minimizes her own opinions.

Closely related to Part II is Part III, the Problems of Classwork. Here again Dr. Cole shows a very keen insight into the difficulties both of the beginning teacher and of the student under his instruction. Some chapters deal with routines with which every teacher must concern himself. The prospective teacher will find valuable suggestions here. In the discussions of the inferior and the superior student, experienced as well as prospective teachers will find valuable presentations. The problems as presented by these groups are not new, but the methods of dealing with such students are under constant and continuous study today.

The remaining parts of the book dealing with the social and economic aspects of college teaching and with the measurement of teaching are of less importance than the preceding parts, except that a young man or woman planning to enter college teaching should do so with a full realization that financial returns are not usually great.

While this volume is somewhat encyclopedic in nature, it is a valuable book for

college teachers, whether prospective or experienced. The style used in writing, the common sense viewpoints expressed, the references to experimental studies, and the concrete illustrations all enhance its value. It is a real contribution.—CHARLES C. McCracken, *School of Education, University of Pennsylvania*.

VOCATIONAL GUIDANCE FOR BOYS,
Robert C. Cole, Harper and Brothers, New York, 1941, 252 pp., \$2.50.

Eleven years experience as Director of Education and Guidance in the Worcester (Mass.) Boys' Club lends a definite note of authority to Mr. Cole's splendid manuscript. Although the book does not intend to be exhaustive, it does attempt "to put in writing some of the more important and practical phases of guidance the author has found useful." Addressed primarily to counselors, teachers, leaders and school executives, it nevertheless avoids theoretical and technical discussions in favor of suggestions, methods and techniques actually tried and found practical by the author in his dealings with hundreds of boys. The underlying principles, however, may be applied to similar problems of girls.

The natural simplicity and clarity with which the original premise of the book is carried forward is merely an illustration of the author's own concept of the aims of guidance:

"If a program of guidance is to be effective it must include all phases of guidance. It must make provisions for the educational, vocational, recreational, physical and personal needs of the individual. Accordingly, a practical program for boys, whether it be conducted in any public or private agency, must consider the whole individual, and not parts of him. . . . A practical program should help the boy to guide himself; to lead him to dis-

cover for himself his interests and abilities; to find out his assets and liabilities, and to capitalize on the former and to overcome the latter; to aid him in making the utmost of his potentialities—to reach the fullest development possible—so that we may render the best possible service to society and thus achieve a maximum degree of success, personal satisfaction, and happiness.”

All lines of demarcation between educational and vocational guidance are dispelled, therefore, in the light of such concepts.

No attempt is made to survey or study occupations, since the general theme dealt with includes rather detailed outlining of steps for organizing a program together with typical forms of guidance programs which may be adopted to meet the needs of diverse institutions. Group and individual counseling are discussed and illustrated at great length, for it is evident that the author regards these as the most essential part of any guidance program. Individual, psychological, and aptitude testing, tryouts, placements, and follow-up have been treated from the point of view of their practical application. The bibliographical material in these chapters should be invaluable to any one dealing with youth.

Very little remains unsaid throughout the entire work regarding the techniques of setting up a practical guidance program, from the detailed description of the counselor's physical environment to his actual conversational approach to the individual and all agencies in any way connected with him. The emphasis upon sincere friendly interest on the part of the counselor in dealing with people whether they be the counselee or remotely interested persons, confirms once more this reviewer's strong conviction that all success in guidance counseling depends to a large degree upon the intellectual integrity, keen perception, and inherent personality of the counselor.

In other words, unless the desired qualities for “a maximum degree of success, personal satisfaction, and happiness” are dominant in the one who leads human beings toward a goal, no amount of written material essentially as provocative as the author's book will suffice to make successful counseling.

All factors being equal, then, this book stands as a worthy primer for the shelf of any institution seeking to help young people. The experienced and beginners alike in the field of guidance would do well to listen to the voice of Robert C. Cole.—HARRY F. GRACEY, *Guidance Counselor, Upper Darby, Pa.*

HOW TO BREAK INTO RADIO, Robert De Haven and Harold S. Kahm, Harper and Brothers, New York, 1941. \$2.00.

Few tasks are more difficult than to tell a young man or woman how to break into radio. The field is small, with probably 20,000 to 25,000 jobs in all, including talent; probably no more than 10,000 of them are of interest to the college graduate. The premium placed on experience is high and there are extremely few positions in the average station or agency radio department where the newcomer can secure that experience. The road into radio is mainly through the small local station or through related fields, such as general selling and the entertainment business. Thus, while radio pays well, only a few of the thousands seeking to enter the field ever receive the opportunity to do so. Those who do break in achieve their goal by a combination of ingenuity, pertinacity and luck, as Chapter 12 of the DeHaven-Kahm book well illustrates.

In other ways than what is an understandable optimism, the DeHaven-Kahm book reflects the difficulties of writing on this subject. The general structure of the

industry has been sketchily treated—especially as regards differences in the organization of various classes of stations, agency radio departments and special representative organizations. Typical station organization charts and a more complete description of different broadcasting functions would have been of material assistance. Likewise, some phases of radio operation have been treated all too sketchily, especially the technical, sales, merchandising and promotional functions.

On the other hand, the generally good treatment of the program phase of radio is an indication of Mr. DeHaven's knowledge of his job as a program director. The word of caution concerning radio schools and courses is timely and applies even to institutions of higher learning, although there would be considerable disagreement with the list of subjects which the authors believe to be unteachable.

It is to be regretted that the average salaries of different classes of stations in various sizes of communities was not presented in the Miscellany, rather than total industry averages, since they would have been less misleading as to wage opportunities.

However, if read reflectively for what is implied, as well as what is stated, the book should be very helpful to those seeking to break into the program phase of broadcasting.—HERMAN S. HETTINGER, *Associate*

Professor of Marketing, Wharton School of Finance and Commerce, University of Pennsylvania.

SIX WAYS TO GET A JOB, Paul W. Boynton, Harper & Brothers, New York, 1940, ix and 147 pp., \$1.50.

In his preface the author, Paul W. Boynton, Supervisor of Employment of the Socony-Vacuum Oil Company, poses the question "Why another book on the technique of job hunting?" and then goes on to explain that his present opus is the result of "witnessing so many instances of people of more than average ability continuing to be unemployed because they do not know how to sell their services in a suitable market . . . most people do their poorest job of selling with the most important product they will ever have to sell—their selves."

The "six ways" advocated are through the placement bureau of college or high school; friends and relatives; commercial agencies; personal solicitation; letters of application; and commercial advertising. The relative value of these is parallel to the order in which they are given.

Regardless of the channels used in job finding, whether the applicant register with his college bureau or rely upon the support and prestige of his relatives and friends, or use any of the other four methods suggested, there are certain factors upon which his

Perhaps there is some branch of our business which appeals to you as a life career—either in this country or abroad. We require a limited number of qualified young men each year. The Director of your University Placement Service has information on file about our Company. Consult him; he will be glad to assist you.

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satisfactory placement depends, and these factors are under his own control, alone.

Mr. Boynton points the issue that although many thousands look for jobs each year, so do many jobs go looking for people to fill them. *Know thyself*, your limitations, your abilities, your aspirations; *know the job*, its place in the company's organization, what training it requires, what it has to offer. Says the author, aviation is an expanding industry, but the demand is less for pilots than for mechanics. Don't, according to Mr. Boynton, lament "there must be *something* I can do!" Find out by studying the company's products or services, its methods of operation and its scope of activity what that *something* is, and then apply for the job.

The book contains readable and valuable chapters on letter writing, personal appli-

cation, the interview, attitudes and advancement. It does not stop with ways of obtaining a job, but contains worthwhile information for those who are in their first jobs on *how to keep them*, and for those who are "in a rut" on *what to do about it*.

Through twenty years of employment work Mr. Boynton has garnered those factors which he has observed to be most helpful in obtaining work, or which have most seriously hampered its seekers. With a natural flair for colorful expression he has combined these into a most enjoyable and practical book. I recommend it for the shelves of every placement bureau, and to the attention of anyone looking for congenial employment.—E. CRAIG SWEETEN, JR., Assistant Director, University of Pennsylvania Placement Service.



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CONTRIBUTOR'S PAGE

Dr. C. O. Williams, whose article on *Teacher Selection* appears on page 24 of this issue, received his early education in the public schools of Missouri and Iowa. He received the B. S. degree from the State Teachers College at Warrensburg (Mo.) in 1921; the M.A. degree from Teachers College, Columbia University, in 1928; and the Ed.D. from New York University in 1936. His dissertation, "Education in a Democracy," was published as an introductory text book on Education by Prentice-Hall in 1937.

He was principal of the Boonsville (Mo.) High School, 1921-23; of the Jefferson City (Mo.) High School, 1923-26; assistant professor of Education at the Pennsylvania State College, 1926-33; and associate professor since that time. From September 1938 to February 1940 he was Assistant Director of Teacher Education and Certification, Pennsylvania State Department of Public Instruction. He was recently appointed Assistant Administrative Head of the Lower Division of the Pennsylvania State College. He is also Director of the Bureau of Records and Recommendations in the School of Education, Pennsylvania State College.

Rear Admiral John Henry Towers (*Naval Aviation*, page 13) is Aviator Number One of the U. S. Navy. His colorful career began with the going out of sailing ships (he spent the summer of 1903 aboard the well-known windjammer, U. S. S. HARTFORD) and coincided with the first attempts of the Navy to take the air. Following his graduation from the Naval Academy in 1906 he served aboard the U. S. S. KENTUCKY and the U. S. S. MICHIGAN before he applied for and was assigned instruction in aviation, under

Glenn H. Curtiss. In 1911 he became one of the first three naval officers assigned to aviation duty.

In June 1912, while flying as a passenger in a Wright seaplane, he and his pilot were thrown from the plane at an altitude of 1,700 feet by a sudden atmospheric disturbance. The pilot fell clear and was killed, but Lt. Towers managed to grasp the plane and fell with it, suffering severe injuries. As a result of this accident, safety belts were adopted. In October of the same year he established a world endurance record for seaplanes and an American record for any type plane, by making a flight of six hours and ten minutes in a Curtiss seaplane. After the World War he organized and commanded a unit of flying boats known as the "NC" type which, in May 1919 made the first transatlantic flight in the history of the world.

In June 1938, Captain Towers left the command of the U. S. S. SARATOGA to become Assistant Chief of the Bureau of Aeronautics and in June 1939 he was appointed by President Roosevelt to his present position as Chief of the Bureau. He became a Rear Admiral in June 1939.

Industrial Hygiene as a Career (page 34) is the contribution of **Theodore Hatch**, associate professor of Industrial Hygiene, University of Pennsylvania School of Medicine. Professor Hatch is a graduate Civil and Sanitary Engineer. He served with the Tennessee Department of Public Health as an assistant Sanitary Engineer from 1925 until 1926 when he became an instructor in Sanitary Engineering at Harvard Engineering School. In 1928 he became instructor in Industrial Sanitation at the Harvard Engineering School and School of Public Health. In 1936 he was appointed Associate Dust

Control Engineer in the Division of Industrial Hygiene, New York Department of Labor. He has been in his present position since 1940.

As chairman of the Advisory Board of Plastics Industries Technical Institute, the first school organized for the specific purpose of training young men for the plastics industry, **E. F. Lougee** (*Plastics—A New Industry*, page 5) acts as liaison man between the school and the industry. In his capacity as editor for five years of *Modern Plastics*, the only American magazine devoting its entire effort to the plastics field, Mr. Lougee gained a wide knowledge of plastics and their many applications. He is personally acquainted with suppliers of plastic materials, molders, laminators, fabricators, designers, press manufacturers, and tool and die makers as well as principal users of plastic products. He is a charter member of the Society of the Plastics Industry, and is serving his second term on its Board of Directors.

After receiving the B.A. degree from Bucknell University, the M.A. from the Pennsylvania State College and the LL.B. from Temple University, **M. M. Walter** (*Vocational Guidance, Training and Placement for the Handicapped*, page 28) spent a number of years in an administrative capacity in the field of industrial education, both in private industry and the public schools. From 1926 to 1931 he was associate professor of Industrial Education at the Pennsylvania State College, and since 1931 he has been Director of Vocational Rehabilitation for the State Board for Vocational Education and the Bureau of Rehabilitation in the Department of Labor and Industry, Harrisburg, Pennsylvania.

Ambrose Caliver, author of *Vocational Guidance Problems of Negroes* (page 44) holds, in addition to degrees from Knoxville College (B.A.), University of Wisconsin (M.A.) and Columbia University (Ph.D.), a diploma in Cabinet Making from Tuskegee Institute and a diploma in Personnel Management from Harvard University. He has been an instructor and principal in public schools, instructor and Dean at Fisk University, and instructor in Guidance and Vocational Education at Howard University and Minor Teachers College. He is Chairman of the Committee for Special Groups, National Vocational Guidance Association, and Senior Specialist in the Education of Negroes, U. S. Office of Education, Washington.

Dr. Frank G. Davis, who is professor of Education and head of the Department of Education at Bucknell University, contributed *The Bucknell Guidance Workshop* on page 49 of this issue. He is himself a graduate of Kansas Wesleyan University, from which he received the Ph.B. in 1911. He also holds the M.A. degree (Columbia University, 1924) and the Ph.D. (New York University, 1930).

Dr. Davis has had wide experience in Education. He taught in rural schools from 1901-03, following attendance at Clarion (Pa.) Normal School, and was principal of grade schools from 1903 to 1905 and from 1906 to 1908. Following his graduation from Kansas Wesleyan University he became Superintendent of Schools at Valdez, Alaska until 1917, when he went to Auburn, Washington. In 1918 he became principal of a junior high school in Cleveland, Ohio, where he stayed until he was appointed Professor of Education at Bucknell University in 1924. The following year, 1925, he became Director of the Demonstration School at Bucknell, and in 1935, Director of Summer School and Extension.

He is a member of the National Education Association; the Pennsylvania State Education Association, of which he was president in 1927 and 1930; and the Association of Liberal Arts Colleges of Pennsylvania for the Advancement of Teaching, of which he is now president after having served as secretary and treasurer. He is author, with his wife, of *Guidance for Youth*, published in 1928. He has also published *A Course in Supervised Teaching* (1933) and *A History of Education in Alaska*.

VOCATIONAL GUIDANCE PROBLEMS OF NEGROES

(Continued from page 48)

is no greater among them than among other groups when they are given the incentive which comes from opportunities to advance.

Changing the attitudes of employers and employees about Negroes should not be attempted by exhortation, but rather by the presentation of facts and examples of how Negroes have succeeded as workers. Emphasis should be given at present to the fact that there is not a single recorded instance in this country of a Negro saboteur, fifth columnist, nor traitor.

The problems regarding both preparation for a vocation and finding employment should be attacked jointly by school people, employers, employees and representatives of the public if effectual and lasting results are to be achieved.

Follow-up

One of the problems which Negro workers face and which should be considered by those carrying out a follow-up program is lack of opportunity to advance in the job and thus become indispensable. Because in general they perform the heavy, less skilled operations, Negroes are usually the first to be dropped when retrenchment becomes neces-

sary, and are usually the first to be replaced by the development of new machines.

Because of the beliefs held about Negroes' inability to do anything except the laborious, unskilled tasks, little or no thought has been given to training them for the semi-skilled operations which are increasing rapidly with the growth of technology. Consequently, on the one hand, they are not being absorbed in the new occupations, and on the other, they are being pushed out of the jobs which they formerly held.

A third problem about which Negroes themselves should take some initiative is their frequent unwillingness to study and better prepare themselves for the new demands made by occupational changes. School administrators and counselors should promote a campaign through parent-teacher associations, civic organizations and churches in order to increase the interest of Negro adults in their self-improvement. At the same time they should make studies of the needs and of instruction adaptable to the type of re-education required to meet modern job conditions.

Application of Principles of Democracy

Schools and communities of the North afford many excellent opportunities to apply the principles of democracy in the guidance of Negroes. The lack of legal restrictions, and the greater freedom of action resulting therefrom furnish an atmosphere conducive to the fullest and best operation of a guidance program; for guidance is the most democratic phase of our educational process. In carrying out a program of guidance adequately, the following assumptions must be accepted: (1) that the sacredness of the personality of each individual should be respected; (2) that the right of each person to develop his personality to its maximum possibilities is limited only by the rights of others; (3) that the differences among indi-

viduals provide the variety and potentialities necessary to progress; and (4) that all these assumptions apply equally to Negroes as to others.

In these days of crisis we need a reservoir of well-trained workers. The seriousness of the situation demands that we utilize every individual in the task to which he is best suited, regardless of race; and the interest of national unity requires that everyone be given a chance to learn and to work. Machines and materials are useless without morale; and morale stems from the knowledge that everyone, regardless of race, color and status has an equal opportunity to life, liberty, and the pursuit of happiness; that we are striving toward common goals; and

that all will share the benefits in terms of their abilities and needs. Whatever else guidance workers do, unless they make some contribution toward developing sufficient national unity to preserve our democracy their work will ultimately be in vain, for guidance, in the truest sense, can exist only in a democracy. Guidance workers in the North have the responsibility to find talent wherever it may be, in white skin, brown skin, or black skin, or whether in mansions or hovels; to give that talent every possible opportunity to grow and fructify to its maximum possibilities; and to exert every effort to see that the talent is used for the satisfaction of the individual possessing it and the welfare of the Nation.

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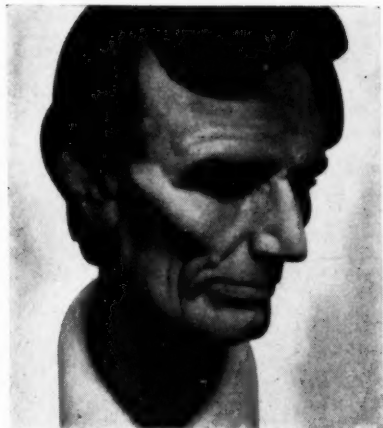
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